Proceedings of the
National Academy of Sciences
of the United States of America

VOLUME 53, 1965

EDITORIAL BOARD OF THE PROCEEDINGS

SAUNDERS MAC LANE, *Chairman and Editor*
JOHN T. EDSALL, *Vice Chairman and Associate Editor*
HUGH L. DRYDEN, *Home Secretary* HARRISON S. BROWN, *Foreign Secretary*
L. V. BERKNER, *Treasurer*

MANSON BENEDICT
S. CHANDRASEKHAR
CARL DJERASSI
KATHERINE ESAU
THOMAS FRANCIS, JR.
HERBERT FRIEDMAN
R. W. GERARD
ARTHUR KORNBERG
GORDON J. F. MACDONALD
H. L. SHAPIRO
D. C. SPENCER
FRANCIS J. TURNER

Editorial Associate: JOSEPHINE A. WILLIAMS

★

PUBLISHED MONTHLY BY
THE NATIONAL ACADEMY OF SCIENCES

I N D E X

Abelian 2-Sylow subgroups (Janko), 657
Accretive boundary problems of the second order (Wolf), 5
Acetylation of: carboxypeptidase A (Bender *et al.*), 711; fetal and chicken hemoglobins (Marchis-Mouren and Lipmann), 1147
Acetylcholine-stimulated phosphatidylinositol synthesis (Hokin), 1369
ACKERS, G. K., and T. E. THOMPSON. Determination of Stoichiometry and Equilibrium Constants for Reversibly Associating Systems by Molecular Sieve Chromatography, 342
Acriflavine resistance (Silver), 24
Actinomycin D: effect on endotoxin- and virus-induced inhibitors in rabbits (Ho and Kono), 220; as inhibitor of hydroxyproline formation (Bekhor and Bavetta), 613; as inhibitor of mouse skin tumorigenesis (Gelboin *et al.*), 1353
Action currents in nerve fibers (Lorente de Nó and Honrubia), 938, 1384
Action potentials, production of (Lorente de Nó and Honrubia), 757
Acyl carrier protein (Majerus *et al.*), 410
Adenosinetriphosphate activity and sarcomere length (Ward *et al.*), 1377
ADLER, J. *See* Sly, W. S., 378
ADLER, N. *See* Wilson, J. R., 1392
Adrenocorticotropic hormone in regulation of corticosterone production (Garren *et al.*), 1443
AGIN, D., L. HERSH, and D. HOLTZMAN. The Action of Anesthetics on Excitable Membranes: A Quantum-Chemical Analysis, 952
Alanine RNA: cleavage of (Penswick and Holley), 543; oligonucleotide fragments from (Apgar *et al.*), 546
ALBERS, R. W., G. R. DE LORES ARNAIZ, and E. DE ROBERTIS. Sodium-Potassium-Activated ATPase and Potassium-Activated *p*-Nitrophenylphosphatase: A Comparison of Their Subcellular Localizations in Rat Brain, 557
ALBERTS, A. W. *See* Majerus, P. W., 410
Aldolases, mechanism of action of (Cremona *et al.*), 1395
ALEXANDER, M. L., and E. GLANGES. Genetic Damage Induced by Ethylenimine, 282
Alkaloid, indole, biosynthesis of (Money *et al.*), 901
ALPERS, D. H., and G. M. TOMKINS. The Order of Induction and Deinduction of the Enzymes of the Lactose Operon in *E. coli*, 797
Amino acid acceptor and transfer functions of sRNA (Nishimura and Novelli), 178
Amino acid incorporation into myelin proteolipid (Klee and Sokoloff), 1014
Amino acid sequence studies with Bence-Jones proteins (Hilschmann and Craig), 1403
Aminoacylation inhibition by sRNA (Torres-Gallardo and Kern), 91
Aminoacyl-sRNA binding to ribosomes (Thach and Sundararajan), 1021
Aminoacyl-sRNA formation (Barnett), 1462
Analytic continuation and holomorphy envelopes (Bochner), 904
ANDERSON, J. S., M. MATSUHASHI, M. A. HASKIN, and J. L. STROMINGER. Lipid-Phosphoacetylmuramyl-Pentapeptide and Lipid - Phosphodisaccharide - Pentapeptide: Presumed Membrane Transport Intermediates in Cell Wall Synthesis, 881
ANDERSON, W. *See* Dobzhansky, T., 482
ANDREWS, F. C. On the Nature of the Spectrum of the Time Correlation Function Matrix for Stochastic Processes, 1284
Anesthetic action on excitable membranes (Agin *et al.*), 952
ANFINSEN, C. B. *See* Givol, D., 676
Anilides and phenylureas (Kamrin *et al.*), 1118
Antibody fragment, specific activity of, after unfolding and reduction (Whitney and Tanford), 524
Antigen: production by oncogenic viruses (Hoggan *et al.*), 12; phagocytosis of (Frei *et al.*), 20; isolation of soluble transplantation (Kahan), 153; SV40-induced complement-fixing (Gilden *et al.*), 684
APGAR, J., G. A. EVERETT, and R. W. HOLLEY. Isolation of Large Oligonucleotide Fragments from the Alanine RNA, 546
Arginine synthesis, genetic control (Baumberg *et al.*), 1029
ARNAUD, C. *See* Tenenhouse, A., 818
Aromatic azo derivatives preventing mammary cancer (Huggins and Pataki), 791
ASHMOLE, N. P. Adaptive Variation in the Breeding Regime of a Tropical Sea Bird, 311
Asymptotic fixed-point theory (Jones), 1262
Asymptotic theory of free torsional Earth oscillations (Pekeris), 1254
Atmosphere of earth, evolution of: ocean water and (Holland), 1173; biochemical and biological (Commoner), 1183; geochemical aspects of (Davidson), 1194; fossils, early life, and (Fischer), 1205; components, history of (Berkner and Marshall), 1215
Atmosphere, plant volatiles in (Rasmussen and Went), 215
ATTARDI, G., P. C. HUANG, and S. KABAT. Recognition of Ribosomal RNA Sites in DNA, I. Analysis of the *E. coli* System, 1490
Autoradiographic localization of phosphatidylinositol synthesis (Hokin), 1369
A-value determination (Biellmann and Johnson), 891
AXELROD, J. *See* Snyder, S. H., 301
Azotobacter vinelandii nitrogen fixation (Bulen *et al.*), 532
AZZI, A. *See* Azzone, G. F., 1084
AZZONE, G. F., and A. AZZI. Volume Changes in Liver Mitochondria, 1084

Bacillus subtilis: DNA synthesis during spore germination of (Yoshikawa), 1476
BACON, D. F. *See* Baumberg, S., 1029
Bacterial infection effect on protein synthesis (Williams *et al.*), 622
Bacteriophage development influenced by hydrocarbons (Hsu *et al.*), 517

Bacteriophage mutation affecting dye uptake by bacterial cells (Silver), 24
Bacteriophage SP8, D-mannose in DNA of (Rosenberg), 836
BALLS, A. K. Concerning Trypsinogen, 392
Barley roots, cation transport in (Epstein and Rains), 1320
BARMAN, T. E., and H. GUTFREUND. The Application of the Rapid-Flow Sampling Technique to the Chemical Identification of Intermediates in Trypsin-Catalyzed Reactions, 1243
BARNETT, W. E. Interspecies Aminoacyl-sRNA Formation: Fractionation of Neurospora Enzymes Involved in Anomalous Aminoacylation, 1462
BARNUM, C. P. *See* Yarbro, J. W., 1033
Base sequences in codewords (Erhan *et al.*), 646
BASSEL, A. *See* Hotta, Y., 356
BATES, R. R. *See* Gelboin, H. V., 1353
BAUMBERG, S., D. F. BACON, and H. J. VOGEL. Individually Repressible Enzymes Specified by Clustered Genes of Arginine Synthesis, 1029
BAVETTA, L. A. *See* Bekhor, I. J., 613
BEARDEN, A. J., T. H. MOSS, W. S. CAUGHEY, and C. A. BEAUDREAU. Mössbauer Spectroscopy of Heme and Hemin Compounds, 1246
BEARN, A. G. *See* Bowman, B. H., 722
BEAUDREAU, C. A. *See* Bearden, A. J., 1246
BECKER, Y. *See* Levine, E. M., 350
BEER, M. *See* Moudrianakis, E. N., 564
BEISSON, J., and T. M. SONNEBORN. Cytoplasmic Inheritance of the Organization of the Cell Cortex in *Paramecium aurelia*, 275
BEKHOR, I. J., and L. A. BAVETTA. Actinomycin D Inhibition of Microsomal-Bound Hydroxyproline Formation in Rabbit Embryo Skin *in vitro*, 613
BELLMAN, R. On the Application of Dynamic Programing to the Determination of Optimal Play in Chess and Checkers, 244
———, H. H. KAGIWADA, and R. E. KALABA. On the Identification of Systems and the Unscrambling of Data, I. Hidden Periodicities, 907
———, H. KAGIWADA, R. KALABA, and S. UENO. On the Identification of Systems and the Unscrambling of Data, II. An Inverse Problem in Radiative Transfer, 910
BELSER, W. L. *See* Hayward, W. S., 1483
BENACERRAF, B. *See* Frei, P. C., 20
Bence-Jones proteins in amino acid sequence studies (Hilschmann and Craig), 1403
BENDER, M. L., J. R. WHITAKER, and F. MENGER. The Effect of Enzyme Acetylation on the Kinetics of the Carboxypeptidase-A-Catalyzed Hydrolysis of Hippuryl-L-β-Phenyllactic Acid, 711
BENNETT, D. The Karyotype of the Mouse, with Identification of a Translocation, 730
BENNETT, T. P., J. GOLDSTEIN, and F. LIPMANN. Coding and Charging Specificities of sRNA's Isolated by Countercurrent Distribution, 385
BENSON, E. S. *See* Ward, P. C. J., 1377
BENZER, S. *See* Weisblum, B., 328
BERGER, M. S. A Sturm-Liouville Theorem for Nonlinear Elliptic Partial Differential Equations, 1277
BERKNER, L. V., and L. C. MARSHALL. History of Major Atmospheric Components, 1215
BERLOWITZ, L. Correlation of Genetic Activity, Heterochromatization, and RNA Metabolism, 68
BERNFIELD, M. R. *See* Trupin, J. S., 807
———. *See* Nirenberg, M., 1161
BERNHARD, S. A., and H. GUTFREUND. The Optical Detection of Transients in Trypsin- and Chymotrypsin-Catalyzed Reactions, 1238
BERTSCH, W. F. *See* Kamrin, M., 1118
BEYCHOK, S. Side-Chain Optical Activity in Cystine-Containing Proteins: Circular Dichroism Studies, 999
BIELLMANN, J. F., and W. S. JOHNSON. An Experimental Method for Determining *A*-Values: The Methyl Group, 891
BILLETER, M. A. *See* Weissmann, C., 653
Binary liquid mixtures, significant structure theory (Miner and Eyring), 1227
Biochemical, biological, and atmospheric evolution (Commoner), 1183
Bioluminescence, molecular mechanism of (Gibson *et al.*), 187
Biosynthesis of: hepatic gluconeogenic enzymes (Weber *et al.*), 96; carbamyl phosphate synthetase (Tatibana and Cohen), 104; f2 coat protein (Schwartz *et al.*), 195, (Schwartz), 1133; bacterial lipopolysaccharide (Zeleznick *et al.*), 207; glucosyl compounds (Mayer *et al.*), 459; insulin chains (Humbel), 853; indole alkaloids (Money *et al.*), 901; pyrimidine, regulation of (Hayward and Belser), 1483
Bird, tropical sea, breeding regime of (Ashmole), 311
BLACK, P. H. *See* Hoggan, M. D., 12
Blood cell precipitation on metal electrodes (Sawyer *et al.*), 294
BLOOM, W., and S. ÖZARSLAN. Electron Microscopy of Ultraviolet-Irradiated Parts of Chromosomes, 1294
BOCHNER, S. Intrinsic Analytic Continuation and Envelopes of Holomorphy, 904
BODDY, P. J. *See* Sawyer, P. N., 294
BODIAN, D. A Suggestive Relationship of Nerve Cell RNA with Specific Synaptic Sites, 418
BOER, F. P. *See* Newton, M. D., 1089
BOGDANOWICZ, W. M. A Generalization of the Lebesgue-Bochner-Stieltjes Integral and a New Approach to the Theory of Integration, 492
BOLING, M. E. *See* Setlow, J. K., 1430
BOLLUM, F. J. *See* Setlow, R. B., 1111
———. *See* Setlow, J. K., 1430
BOMAN, H. G. *See* Kjellin-Stråby, K., 1346
Bone, electron microscopy of (Wyckoff and Doberenz), 230
BOONE, C. W. *See* Levine, E. M., 350
BOONE, W. W. Finitely Presented Group Whose Word Problem Has the Same Degree as That of an Arbitrarily Given Thue System (An Application of Methods of Britton), 265

BORG, D. C. Transient Free Radical Forms of Hormones: EPR Spectra from Catecholamines and Adrenochrome, 633, 890
———. Transient Free Radical Forms of Hormones: EPR Spectra from Iodothyronines, Indoles, Estrogens, and Insulin, 829
Boundary problems, accretive (Wolf), 5
BOWMAN, B. H., and A. G. BEARN. The Presence of Subunits in the Inherited Group-Specific Protein of Human Serum, 722
BOYD, D. H. *See* Raper, J. R., 1324
Brain protein synthesis (Rubin and Stenzel), 963
BRATTAIN, W. H. *See* Sawyer, P. N., 294
BRAUN, R., C. MITTERMAYER, and H. P. RUSCH. Sequential Temporal Replication of DNA in *Physarum polycephalum*, 924
BRAWERMAN, G. *See* Schwartz, J. H., 195
Breeding regime of tropical sea bird (Ashmole), 311
BRIERLEY, G., and D. E. GREEN. Compartmentation of the Mitochondrion, 73
BRILLOUIN, L. The Actual Mass of Potential Energy, A Correction to Classical Relativity, 475
———. The Actual Mass of Potential Energy, II, 1280
BRIMACOMBE, R. L. C. *See* Trupin, J. S., 807
———. *See* Nirenberg, M., 1161
BROOKES, V. J., and C. M. WILLIAMS. Thymidine Kinase and Thymidylate Kinase in Relation to the Endocrine Control of Insect Diapause and Development, 770
BROOKS, J. L. Predation and Relative Helmet Size in Cyclomorphic Daphnia, 119
BROWDER, F. E. Existence of Periodic Solutions for Nonlinear Equations of Evolution, 1100
———. Fixed-Point Theorems for Noncompact Mappings in Hilbert Space, 1272
BRUNNER, T. *See* Leuchtenberger, C., 694
BRUST, D. P., D. S. TARBELL, and S. M. HECHT. Studies of the Cyclizations of an O-(α-Methylallyl)Phenol and the Corresponding Methyl Ether Induced by Electrophilic Reagents, 233
BUCHANAN, B. B. *See* Evans, M. C. W., 1420
BULEN, W. A., R. C. BURNS, and J. R. LECOMPTE. Nitrogen Fixation: Hydrosulfite as Electron Donor with Cell-Free Preparations of *Azotobacter vinelandii* and *Rhodospirillum rubrum*, 532
BUNNENBERG, E. *See* Schooley, D. A., 579
BURGI, E. *See* Hershey, A. D., 325
BURKA, E. R. *See* Marks, P. A., 1437
BURNS, R. C. *See* Bulen, W. A., 532
BYRD, C., E. OHTSUKA, M. W. MOON, and H. G. KHORANA. Synthetic Deoxyribo-Oligonucleotides as Templates for the DNA Polymerase of *Escherichia coli*: New DNA-Like Polymers Containing Repeating Nucleotide Sequences, 79

Calcium reactions with mitochondria (Rasmussen *et al.*), 1069
CALDERÓN, A. P. Commutators of Singular Integral Operators, 1092
Cancer prevention by aromatic azo derivatives (Huggins and Pataki), 791
CANELLAKIS, E. S., H. O. KAMMEN, and D. R. MORALES. Studies on the Enzymic Synthesis of Thymidine-3′-Triphosphate, 184
CAPPS, W. I. *See* J. W. Hartley, 931
Carbamyl phosphate synthetase biosynthesis (Tatibana and Cohen), 104
CARBON, J. A., L. HUNG, and D. S. JONES. A Reversible Oxidative Inactivation of Specific Transfer RNA Species, 979
Carbon dioxide fixation and ferredoxin photoreduction (Evans and Buchanan), 1420
Carbon paths in gluconeogenesis and lipogenesis (Lardy *et al.*), 1410
Carbonic anhydrases, human, optical rotatory dispersion of (Myers and Edsall), 169
Carboxypeptidase A: three-dimensional electron density map of (Hartsuck *et al.*), 396; in enzymatic hydrolysis of hippuryl-L-β-phenyllactic acid (Bender *et al.*), 711; tyrosyl residues of (Roholt *et al.*), 847
CARP, R. I. *See* Gilden, R. V., 684
CARRIER, W. L. *See* Setlow, R. B., 1111
Catalase isozyme recombination (Scandalios), 1035
Cation transport in barley roots (Epstein and Rains), 1320
CAUGHEY, W. S. *See* Bearden, A. J., 1246
Cell cortex in *P. aurelia*, cytoplasmic inheritance of (Beisson and Sonneborn), 275
Cell-free systems of protein synthesis (Ganoza *et al.*), 619; (Williams *et al.*), 622
Cell wall synthesis, membrane transport intermediates in (Anderson *et al.*), 881
Centrifuge, ionic (Slepian), 225
CHANCE, B. *See* Rasmussen, H., 1069
CHANDLEY, A. C. *See* Grell, R. F., 1340
Charge transfer in molecular crystals (McConnell *et al.*), 46
Charging specificities of sRNA's (Bennett *et al.*), 385
Chess and checkers, dynamic programing applied to optimal play in (Bellman), 244
Chick embryo mitochondria, DNA isolation from (Rabinowitz *et al.*), 1126
CHILSON, O. P., G. B. KITTO, and N. O. KAPLAN. Factors Affecting the Reversible Dissociation of Dehydrogenases, 1006
Chironomus thummi chromosomal puffing (Lauffer and Nakase), 511
Chlamydomonas, nonchromosomal gene recombination in (Sager and Ramanis), 1053
Chlamydomonas reinhardi lacking RuDP carboxylase activity (Levine and Togasaki), 987
Chloramphenicol effects on protein synthesis (Wolfe and Weisberger), 991
Chlorophyll-a fluorescence in green plant photosynthesis (Pearlstein), 702
Chlorophyll, optical rotatory dispersion of (Sauer), 716
Chlortetracycline inhibition of protein synthesis (Hierowski), 594
Cholesterol interaction with serum globulin (Francis *et al.*), 1061
Chromatin, frog embryo, as primer for RNA synthesis (Flickinger *et al.*), 783
Chromatin structure in sea urchin sperm (Solari), 503

Chromatography, molecular sieve (Ackers and Thompson), 342
Chromosomes: and nuclei in honeybee cells (DuPraw), 161; electron microscopy of UV-irradiated (Bloom and Özarslan), 1294
Chymotrypsin-catalyzed reactions, optical detection of transients in (Bernhard and Gutfreund), 1238
Circadian rhythm in serotonin content of rat pineal gland (Snyder *et al.*), 301
Circular dichroism: magnetic (Schooley *et al.*), 579; in proteins (Beychok), 999
Circularity and size of DNA in mammalian and plant cells (Hotta and Bassel), 356
CLARK, A. J., and A. D. MARGULIES. Isolation and Characterization of Recombination-Deficient Mutants of *Escherichia coli* K12, 451
CLARK, P. *See* Eichhorn, G. L., 586
CLAUSEN, J. Microclimatic and Vegetational Contrasts within a Subalpine Valley, 1315
Cleavage of yeast alanine RNA (Penswick and Holley), 543
Clonal growth of mammalian cells in synthetic medium (Ham), 288
CLOUD, P. E., JR. Chairman's Summary Remarks (Symposium), 1169
Cluster sets at singularities (Mathews), 1264
Coat protein, f2, synthesis: in *Euglena gracilis* (Schwartz *et al.*), 195; effect of streptomycin on (Schwartz), 1133
Codewords, base sequences in (Erhan *et al.*), 646
Codewords, RNA, and protein synthesis (Pestka *et al.*), 639; (Trupin *et al.*), 807; (Nirenberg *et al.*), 1161
Coding degeneracy for leucine in protein synthesis (Weisblum *et al.*), 328
Coding of sRNA's isolated by countercurrent distribution (Bennett *et al.*), 385
Coenzyme Q in DPNH dehydrogenase (Machinist and Singer), 467
COHEN, P. P. *See* Tatibana, M., 104
Collagen formation from microsomal polypeptide (Peterkofsky and Udenfriend), 335
Collagen precursor, hydroxylation of proline in (Prockop and Juva), 661
Collagen synthesis (Green and Goldberg), 1360
COLLINS, A. *See* Tschudy, D. P., 841
COLVILL, A. J. E., L. C. KANNER, G. P. TOCCHINI-VALENTINI, M. T. SARNAT, and E. P. GEIDUSCHEK. Asymmetric RNA Synthesis *in vitro:* Heterologous DNA-Enzyme Systems; *E. coli* RNA Polymerase, 1140
COMMONER, B. Biochemical, Biological, and Atmospheric Evolution, 1183
Community productivity, biomass, diversity, and stability (Leigh), 777
Commutators of singular integral operators (Calderón), 1092
Complement fixation for mouse leukemia viruses (Hartley *et al.*), 931
Complement-fixing antigen, SV40-induced (Gilden *et al.*), 684
CONCONI, F. M. *See* Marks, P. A., 1437
Conformation of an isolated polymer molecule at an interface (Roe), 50
Contact inhibition in human diploid fibroblasts (Levine *et al.*), 350
Continuous martingales (Dubins and Schwartz), 913
CORMIER, M. J. *See* Kuwabara, S., 822
Corticosterone production by ACTH, protein synthesis in (Garren *et al.*), 1443
Cotton effects of carbonic anhydrases (Myers and Edsall), 169
COWARD, S. J. *See* Flickinger, R. A., 783
COWIE D. B., and A. D HERSHEY. Multiple Sites of Interaction with Host-Cell DNA in the DNA of Phage λ, 57
Crab dAT, preparation and properties of (Davidson *et al.*), 111
CRAIG, L. C. *See* Hilschmann, N., 1403
CREMONA, T., J. KOWAL, and B. L. HORECKER. The Mechanism of Action of Aldolases, XI. Activation by Aromatic Sulfhydryl Reagents and β-Elimination of Selected Thiol Groups, 1395
Crossing-over and DNA replication, coincidence of in Drosophila oöcyte (Grell and Chandley), 1340
Crystal, irradiated thymidine, electron spin resonance of (Pruden *et al.*), 917
Crystalline bacterial luciferase from *Photobacterium fischeri* (Kuwabara *et al.*), 822
Crystals, molecular, charge transfer in (McConnell *et al.*), 46
Cyclizations of O-(α-methylallyl)phenol (Brust *et al.*), 233
Cystine-containing proteins, optical activity in (Beychok), 999
Cytidine diphosphate tyvelose, enzymatic synthesis of (Elbein), 803
Cytoplasmic inheritance of cortical organization in *P. aurelia* (Beisson and Sonneborn), 275

Daphnia, cyclomorphic, predation and helmet size in (Brooks), 119
dAT, native crab (Davidson *et al.*), 111
DAVIDSON, C. F. Geochemical Aspects of Atmospheric Evolution, 1194
DAVIDSON, N., J. WIDHOLM, U. S. NANDI, R. JENSEN, B. M. OLIVERA, and J. C. WANG. Preparation and Properties of Native Crab dAT, 111
DAVIS, W. W. *See* Garren, L. D., 1443
DEFENDI, V. *See* Gilden, R. V., 684
Dehydrogenase, DPNH, coenzyme Q in (Machinist and Singer), 467
Dehydrogenases, reversible dissociation of (Chilson *et al.*), 1006
DE LORENZO, F. *See* Givol, D., 676
DE LORES ARNAIZ, G. R. *See* Albers, R. W., 557
Densitometric and dilatometric volume changes of ribonuclease accompanying pH changes (Krausz and Kauzmann), 1234
Deoxyribo-oligonucleotides as templates for DNA polymerase of *E. coli* (Byrd *et al.*), 79
DE ROBERTIS, E. *See* Albers, R. W., 557
DESALLE, L. *See* Rabinowitz, M., 1126
DE SERRES, F. J. *See* Webber, B. B., 430
Diapause, insect, endocrine control of (Brookes and Williams), 770
Differential equation(s): for theta function (Resnikoff), 692; linear second-order (Galbraith *et al.*), 247; Sturm-Liouville theorem for (Berger), 1277

Digital abnormality, Indian (Ray and Haldane), 1050
Dimers, pyrimidine, in UV-irradiated poly dI:dC (Setlow *et al.*), 1111
7,12-Dimethylbenz(a)anthracene, mammary cancer and adrenal injury from (Huggins and Pataki), 791
Diploid fibroblasts, human, contact inhibition in (Levine *et al.*), 350
Discretization, galactic (Thomas), 227
Dissociation, reversible, of dehydrogenases (Chilson *et al.*), 1006
Disulfide interchange and protein structure (Givol *et al.*), 676
Diuron influence on respiration and photosynthesis of plants (Lundegårdh), 703
DJERASSI, C. *See* Schooley, D. A., 579
D-Mannose in DNA of SP8 bacteriophage (Rosenberg), 836
DNA: host-cell, interaction in λ DNA (Cowie and Hershey), 57; templates for *E. coli* polymerase of (Byrd *et al.*), 79; molecular size and circularity of (Hotta and Bassel), 356; hydrogen exchange in (Printz and von Hippel), 362; microscopy of guanine-labeled (Moudrianakis and Beer), 564; influence of copper (II) on unwinding and rewinding of (Eichhorn and Clark), 586; localization in NO region of *D. melanogaster* (Ritossa and Spiegelman), 737; radiation effects on (Gordy *et al.*), 751; as primer for RNA synthesis (Flickinger *et al.*), 783; thymic extracts enhancing incorporation of labeled precursors into (Klein *et al.*), 812; SP8 bacteriophage, D-mannose in (Rosenberg), 836; UV-induced triplet state in (Rahn *et al.*), 893; transfer from phage T5 to host cells (Lanni), 969; viral, twisted circular form of (Vinograd *et al.*), 1104; isolation from chick embryo mitochondria (Rabinowitz *et al.*), 1126; heterologous enzyme systems of (Colvill *et al.*), 1140; cross-linking and repair of (Kohn *et al.*), 1154; photoreactivable lesions in (Setlow *et al.*), 1430; ribosomal RNA sites in (Attardi *et al.*), 1490
DNA, lambda, interaction sites of (Cowie and Hershey), 57; (Hershey and Burgi), 325
DNA replication: sequential temporal (Braun *et al.*), 924; coincident with crossing-over in Drosophila oöcyte (Grell and Chandley), 1340
DNA synthesis: induced by polyoma virus [(Dulbecco *et al.*), 403, 890, (Weil *et al.*), 1468]; inhibited by hydroxyurea (Yarbro *et al.*), 1033; during spore germination (Yoshikawa), 1476
DOBERENZ, A. R. *See* Wyckoff, R. W. G., 230
DOBZHANSKY, T., B. SPASSKY, and W. ANDERSON. Bichromosomal Synthetic Semilethals in *Drosophila pseudoobscura*, 482
DOGGENWEILER, C. F., and S. FRENK. Staining Properties of Lanthanum on Cell Membranes, 425
DPNH dehydrogenase, coenzyme Q in (Machinist and Singer), 467
Drosophila, bichromosomal synthetic semilethals in (Dobzhansky *et al.*), 482
Drosophila melanogaster: DNA localization in (Ritossa and Spiegelman), 737; DNA replication in oöcyte of (Grell and Chandley), 1340
DUBINS, L. E., and L. J. SAVAGE. A Tchebycheff-Like Inequality for Stochastic Processes, 274
——— and G. SCHWARZ. On Continuous Martingales, 913
DULBECCO, R., L. H. HARTWELL, and M. VOGT. Induction of Cellular DNA Synthesis by Polyoma Virus, 403, 890
DUPRAW, E. J. The Organization of Nuclei and Chromosomes in Honeybee Embryonic Cells, 161
DURE, L. S. *See* Kuwabara, S., 822
Dye uptake by infected bacterial cells (Silver), 24
Dynamic programing in optimal play of chess and checkers (Bellman), 244
Dynamical systems, stability definitions of (Magiros), 1288

EAGLE, H. *See* Levine, E. M., 350
Earth's atmosphere, evolution of (NAS Symposium), 1169
Earth, torsional oscillations of (Pekeris), 1254
ECHOLS, H. *See* Sly, W. S., 378
EDSALL, J. T. *See* Myers, D. V., 169
EDTA and *E. coli* permeability increase (Leive), 745
EDWARDS, C. *See* Ward, P. C. J., 1377
EICHHORN, G. L., and P. CLARK. Interactions of Metal Ions with Polynucleotides and Related Compounds, V. The Unwinding of DNA Strands under the Influence of Copper (II) Ions, 586
EIDLIC, L., and F. C. NEIDHARDT. Role of Valyl-sRNA Synthetase in Enzyme Repression, 539
EIGNER, J. *See* Shapiro, D. M., 874
EIKENBERRY, E. F., and A. RICH. The Direction of Reading Messenger RNA during Protein Synthesis, 668
EISENSTADT, J. M. *See* Schwartz, J. H., 195
ELBEIN, A. D. The Enzymatic Synthesis of Cytidine Diphosphate Tyvelose, 803
Electrochemical precipitation of: mammalian platelets and intravascular thrombosis (Sawyer *et al.*), 200; blood cells on metal electrodes (Sawyer *et al.*), 294; fibrinogen (Ogoniak and Sawyer), 572
Electron density map, three-dimensional, of carboxypeptidase A (Hartsuck *et al.*), 396
Electron microscopy: of Rancho La Brea bone (Wyckoff and Doberenz), 230; with high-field superconducting solenoid lenses (Fernández-Morán), 445; for sequence determination in nucleic acids (Moudrianakis and Beer), 564; of UV-irradiated chromosomes (Bloom and Özarslan), 1294
Electron spin resonance of thymidine crystal (Pruden *et al.*), 917
Electron-transport chain of photosynthesis, plastocyanin in (Fork and Urbach), 1307
ELLISON, B. E. Limits of Infinite Populations under Random Mating, 1266
Endocrine control of insect diapause (Brookes and Williams), 770
Energy, potential, mass of (Brillouin), 475, 1280

Energy propagation in stratified gaseous medium (Rosencrans), 249
Energy trapping in helical polymers (Hillier and Rice), 973
ENGLANDER, J. J. *See* Englander, S. W., 370
ENGLANDER, S. W., and J. J. ENGLANDER. Hydrogen Exchange Studies of sRNA, 370
Envelopes of holomorphy (Bochner), 904
Enzymatic hydrolysis of hippuryl-L-β-phenyllactic acid (Bender *et al.*), 713
Enzymatic hydroxylation of proline on collagen formation (Peterkofsky and Udenfriend), 335
Enzymatic synthesis of CDP-tyvelose (Elbein), 803
Enzyme induction of *E. coli* lactose operon (Alpers and Tomkins), 797
Enzyme localized in acute intermittent porphyria (Tschudy *et al.*), 841
Enzyme repression and valyl-sRNA synthetase (Eidlic and Neidhardt), 539
Enzymes in arginine synthesis (Baumberg *et al.*), 1029
Enzymic synthesis of thymidine-3′-triphosphate (Canellakis *et al.*), 184
EPHRUSSI, B., and M. C. WEISS. Interspecific Hybridization of Somatic Cells, 1040
EPR spectra from free radical forms of hormones (Borg), 633, 829, 890
EPSTEIN, E., and D. W. RAINS. Carrier-Mediated Cation Transport in Barley Roots: Kinetic Evidence for a Spectrum of Active Sites, 1320
ERHAN, S., L. G. NORTHRUP, and F. R. LEACH. A Method Potentially Useful for Establishing Base Sequences in Codewords, 646
Escherichia coli: (Gartner and Orias), 62; (Byrd *et al.*), 79; (Clark and Margulies), 451; (Mayer *et al.*), 459; (Lazzarini and Peterkofsky), 549; (Hierowski), 594; (Leive), 745; (Alpers and Tomkins), 797; (Schwartz), 1133; (Colvill *et al.*), 1140; (Kohn *et al.*), 1154; (Hart), 1415; (Attardi *et al.*), 1490
Ethylenimine and genetic damage (Alexander and Glanges), 282
Euglena gracilis (Schwartz *et al.*), 195
EVANS, M. C. W., and B. B. BUCHANAN. Photoreduction of Ferredoxin and Its Use in Carbon Dioxide Fixation by a Subcellular System from a Photosynthetic Bacterium, 1420
EVERETT, G. A. *See* Apgar, J., 546
Evolution of Earth's atmosphere (NAS Symposium), 1169
EYRING, H. *See* Miner, B. A., 1227

FERNÁNDEZ-MORÁN, H. Electron Microscopy with High-Field Superconducting Solenoid Lenses, 445
Ferredoxin photoreduction used in CO_2 fixation by photosynthetic bacterium (Evans and Buchanan), 1420
Fetal and chicken hemoglobin acetylation (Marchis-Mouren and Lipmann), 1147
Fibers, myelinated nerve (Lorente de Nó and Honrubia), 757, 938, 1384
Fibrinogen, electrochemical precipitation of (Ogoniak and Sawyer), 572
Fibroblastic cell lines, collagen synthesis by (Green and Goldberg), 1360
Finite semigroups derived from machine theory (Krohn and Rhodes), 499
Finite simple group with abelian 2-Sylow subgroups (Janko), 657
FISCHER, A. G. Fossils, Early Life, and Atmospheric History, 1205
FISCHER, J. E. *See* Snyder, S. H., 301
Fixed-point theorems for noncompact mappings (Browder), 1272
Fixed-point theory (Jones), 1262
Flavins and phenols, molecular complexes of (Fleischman and Tollin), 38, 237
FLEISCHMAN, D. E., and G. TOLLIN. Molecular Complexes of Flavins and Phenols, III. Factors Influencing Spectra and Stability, 38
——— and G. TOLLIN. Molecular Complexes of Flavins and Phenols, IV. Semiquinone Hydriodide Complexes, 237
FLICKINGER, R. A., S. J. COWARD, M. MIYAGI, C. MOSER, and E. ROLLINS. The Ability of DNA and Chromatin of Developing Frog Embryos to Prime for RNA Polymerase-Dependent RNA Synthesis, 783
Fluorescence of chlorophyll-a (Pearlstein), 702
FLYGARE, W. H., and J. T. LOWE. Nuclear Quadrupole and Spin-Rotation Interaction of O^{17} in Formaldehyde, 576
FORK, D. C., and W. URBACH. Evidence for the Localization of Plastocyanin in the Electron-Transport Chain of Photosynthesis, 1307
Formaldehyde, O^{17} spin-rotation interaction in (Flygare and Lowe), 576
Fossils, early life, and atmospheric history (Fischer), 1205
FOSTER, J. W. *See* Rode, L. J., 31
FRANCIS, T., JR., N.-S. LING, and T. KRASTEFF. Transcholesterin, a Cholesterol-Binding Globulin: Serological Demonstration of a Specific Interaction between Cholesterol and Serum Globulin, 1061
FRANKLIN, I. R. *See* Levene, H., 1042
FREI, P. C., B. BENACERRAF, and G. J. THORBECKE. Phagocytosis of the Antigen, A Crucial Step in the Induction of the Primary Response, 20
FRENK, S. *See* Doggenweiler, C. F., 425
FRIED, M. Cell-Transforming Ability of a Temperature-Sensitive Mutant of Polyoma Virus, 486
Frog embryos (Flickinger *et al.*), 783
Frog retinal rod ultrastructure (Robertson), 860
Frog skeletal sarcomere length (Ward *et al.*), 1377
FUKUDA, N. *See* Sario, L., 270
Fusion research (Simon), 866

Galactic discretization (Thomas), 227
GALBRAITH, A. S., E. J. MCSHANE, and G. B. PARRISH. On the Solutions of Linear Second-Order Differential Equations, 247
Ganglion, cervical (Hokin), 1369
Gangliosides as serotonin receptors (Woolley and Gommi), 959
GANOZA, M. C., C. A. WILLIAMS, and F. LIPMANN. Synthesis of Serum Proteins by a Cell-Free System from Rat Liver, 619
———. *See* Williams, C. A., 622

GARREN, L. D., R. L. NEY, and W. W. DAVIS. Studies on the Role of Protein Synthesis in the Regulation of Corticosterone Production by Adrenocorticotropic Hormone, *in vivo*, 1443
GARTNER, T. K., and E. ORIAS. Pleiotropic Effects of Suppressors of a *Lac*-"Operator Negative" Mutation in *Escherichia coli*, 62
Gaseous hydrocarbons and germination of bacterial spores (Rode and Foster), 31
Gaseous medium, stratified, energy propagation in (Rosencrans), 249
GEIDUSCHEK, E. P. *See* Colvill, A. J. E., 1140
GELBOIN, H. V., M. KLEIN, and R. R. BATES. Inhibition of Mouse Skin Tumorigenesis by Actinomycin D, 1353
Genes of arginine synthesis (Baumberg *et al.*), 1029
Genetic activity, heterochromatization, and RNA metabolism (Berlowitz), 68
Genetic damage induced by ethylenimine (Alexander and Glanges), 282
Genetic load in Tribolium (Levene *et al.*), 1042
Genetics of digital abnormality (Ray and Haldane), 1050
Geochemical aspects of atmospheric evolution (Davidson), 1194
Germination, *B. subtilis* spore, DNA synthesis during (Yoshikawa), 1476
GIBSON, Q. H., J. W. HASTINGS, and C. GREENWOOD. On the Molecular Mechanism of Bioluminescence, II. Light-Induced Luminescence, 187
GILDEN, R. V., R. I. CARP, F. TAGUCHI, and V. DEFENDI. The Nature and Localization of the SV40-Induced Complement-Fixing Antigen, 684
GIVOL, D., F. DE LORENZO, R. F. GOLDBERGER, and C. B. ANFINSEN. Disulfide Interchange and the Three-Dimensional Structure of Proteins, 676
GLANGES, E. *See* Alexander, M. L., 282
Gluconeogenesis and lipogenesis, carbon paths in (Lardy *et al.*), 1410
Glucosyl compounds, selectivity of biosynthesis of (Mayer *et al.*), 459
Glycogen, particulate, synthesis of (Mordoh *et al.*), 86
GOLDBERG, B. *See* Green, H., 1360
GOLDBERGER, R. F. *See* Givol, D., 676
GOLDSTEIN, A. L. *See* Klein, J. J., 812
GOLDSTEIN, J. *See* Bennett, T. P., 385
GOMMI, B. W. *See* Woolley, D. W., 959
GOMORY, R. E. On the Relation between Integer and Noninteger Solutions to Linear Programs, 260
GONANO, F. *See* Weisblum, B., 328
GORDY, W., B. PRUDEN, and W. SNIPES. Some Radiation Effects on DNA and Its Constituents, 751
———. *See* B. Pruden, 917
GREEN, D. E., and O. HECHTER. Assembly of Membrane Subunits, 318
———. *See* Brierley, G., 73
GREEN, H., and B. GOLDBERG. Synthesis of Collagen by Mammalian Cell Lines of Fibroblastic and Nonfibroblastic Origin, 1360
GREENBERG, G. R. *See* Shapiro, D. M., 874
GREENWOOD, C. *See* Gibson, Q. H., 187
GRELL, R. F., and A. C. CHANDLEY. Evidence Bearing on the Coincidence of Exchange and DNA Replication in the Oöcyte of *Drosophila melanogaster*, 1340
Group: finitely presented (Boone), 265; finite simple (Janko), 657
Guanine-labeled DNA (Moudrianakis and Beer), 564
GUTFREUND, H. *See* Barman, T. E., 1243
———. *See* Bernhard, S. A., 1238

HALDANE, J. B. S. *See* Ray, A. K., 1050
HAM, R. G. Clonal Growth of Mammalian Cells in a Chemically Defined, Synthetic Medium, 288
Harmonic functions and minimum norms in Riemannian spaces (Sario and Fukuda), 270
HART, R. G. Surface Features of the 50S Ribosomal Component of *Escherichia coli*, 1415
HARTLEY, J. W., W. P. ROWE, W. I. CAPPS, and R. J. HUEBNER. Complement Fixation and Tissue Culture Assays for Mouse Leukemia Viruses, 931
HARTMAN, P. E., C. RUSGIS, and R. C. STAHL. Orientation of the Histidine Operon in the *Salmonella typhimurium* Linkage Map, 1332
Hartree-Fock molecular orbital theories (Newton *et al.*), 1089
HARTSUCK, J. A., M. L. LUDWIG, H. MUIRHEAD, T. A. STEITZ, and W. N. LIPSCOMB. Carboxypeptidase A, II. The Three-Dimensional Electron Density Map at 6 Å Resolution, 396
HARTWELL, L. H. *See* Dulbecco, R., 403, 890
HASELKORN, R. *See* Rabinowitz, M., 1126
HASKIN, M. A. *See* Anderson, J. S., 881
HASTINGS, J. W. *See* Gibson, Q. H., 187
HAYWARD, W. S., and W. L. BELSER. Regulation of Pyrimidine Biosynthesis in *Serratia marcescens*, 1483
HECHT, S. M. *See* Brust, D. P., 233
HECHTER, O. *See* Green, D. E., 318
Helical polymers, energy trapping in (Hillier and Rice), 973
Helmet size and predation in Daphnia (Brooks), 119
Heme spectroscopy (Bearden *et al.*), 1246
Hemoglobin acetylation (Marchis-Mouren and Lipmann), 1147
Hemolysin in rabbits after radiation (Taliaferro and Taliaferro), 139
Hepatic gluconeogenic enzymes (Weber *et al.*), 96
HERSH, L. *See* Agin, D., 952
HERSHEY, A. D., and E. BURGI. Complementary Structure of Interacting Sites at the Ends of Lambda DNA Molecules, 325
———. *See* COWIE, D. B., 57
Heterochromatization, genetic activity, and RNA metabolism (Berlowitz), 68
HIEROWSKI, M. Inhibition of Protein Synthesis by Chlortetracycline in the *E. coli in vitro* System, 594
Hilbert space (Browder), 1272
HILLIER, I. H., and S. A. RICE. A Conjecture on Conformations Leading to Energy Trapping in Helical Polymers, 973

HILSCHMANN, N., and L. C. CRAIG. Amino Acid Sequence Studies with Bence-Jones Proteins, 1403
Hippuryl-L-β-phenyllactic acid hydrolysis by carboxypeptidase A (Bender *et al.*), 711
Histidine operon in *S. typhimurium* linkage map (Hartman *et al.*), 1332
Histone regulation of RNA synthesis in nucleoli (Liau *et al.*), 626
HNILICA, L. S. *See* Liau, M. C., 626
Ho, F. K. *See* Levene, H., 1042
Ho, M., and Y. KONO. Effect of Actinomycin D on Virus and Endotoxin-Induced Interferonlike Inhibitors in Rabbits, 220
HOFFMAN, B. M. *See* Mcconnell, H. M., 46
HOGGAN, M. D., W. P. ROWE, P. H. BLACK, and R. J. HUEBNER. Production of "Tumor-Specific" Antigens by Oncogenic Viruses during Acute Cytolytic Infections, 12
HOKIN, L. E. Autoradiographic Localization of the Acetylcholine-Stimulated Synthesis of Phosphatidylinositol in the Superior Cervical Ganglion, 1369
HOLLAND, H. D. The History of Ocean Water and Its Effect on the Chemistry of the Atmosphere, 1173
HOLLEY, R. W. *See* Penswick, J. R., 543
———. *See* Apgar, J., 546
HOLTZMAN, D. *See* Agin, D., 952
Honeybee embryonic cell nuclei and chromosomes (DuPraw), 161
HONRUBIA, V. *See* Lorente de Nó, R., 757, 938, 1384
HORECKER, B. L. *See* Zeleznick, L. D., 207
———. *See* Cremona, T., 1395
Hormonal free radicals, EPR spectra from (Borg), 633, 829, 890
HOTTA, Y., and A. BASSEL. Molecular Size and Circularity of DNA in Cells of Mammals and Higher Plants, 356
HSU, W.-T., J. W. MOOHR, and S. B. WEISS. The Influence of Polycyclic Aromatic Hydrocarbons on Bacteriophage Development, 517
HUANG, P. C. *See* Attardi, G., 1490
HUEBNER, R. J. *See* Hoggan, M. D., 12
———. *See* Hartley, J. W., 931
HUGGINS, C., and J. PATAKI. Aromatic Azo Derivatives Preventing Mammary Cancer and Adrenal Injury from 7,12-Dimethylbenz(a)anthracene, 791
Human diploid fibroblasts (Levine *et al.*), 350
Human serum group-specific protein (Bowman and Bearn), 722
HUMBEL, R. E. Biosynthesis of the Two Chains of Insulin, 853
HUNG, L. *See* Carbon, J. A., 979
HUNTER, G., JR. *See* Tschudy, D. P., 841
HURLBERT, R. B. *See* Liau, M. C., 626
Hybridization of somatic cells (Ephrussi and Weiss), 1040
HYDÉN, H., and P. W. LANGE. A Differentiation in RNA Response in Neurons Early and Late during Learning, 946
Hydrocarbons, gaseous, and spore germination (Rode and Foster), 31
Hydrocarbons in bacteriophage development (Hsu *et al.*), 517
Hydrogen exchange studies: of DNA structure (Printz and von Hippel), 362; of sRNA (Englander and Englander), 370
Hydrolysis of hippuryl-L-β-phenyllactic acid by carboxypeptidase A (Bender *et al.*), 711
Hydrosulfite as electron donor for nitrogen fixation (Bulen *et al.*), 532
p-Hydroxybenzoate-U-C^{14} conversion to ubiquinone (Parson and Rudney), 599
Hydroxylation of proline in microsomal polypeptide (Peterkofsky and Udenfriend), 335
Hydroxyproline formation in rabbit embryo skin (Bekhor and Bavetta), 613
Hydroxyproline synthesis (Prockop and Juva), 661
Hydroxyurea inhibition of DNA synthesis (Yarbro *et al.*), 1033

IMAMOTO, F., T. YAMANE, and N. SUEOKA. Existence of Two Phenylalanyl-sRNA Synthetases in *Neurospora crassa*, 1456
Incompatibility loci in *Schizophyllum* (Raper *et al.*), 1324
Indian digital abnormality (Ray and Haldane), 1050
Indole alkaloid biosynthesis (Money *et al.*), 901
Induction kinetics of *N. crassa* mutations (Webber and de Serres), 430
Infinite populations under random mating, limit theorems for (Ellison), 1266
Influenza virus in production of malignant kidney tumors in mice (Leuchtenberger *et al.*), 694
Information in part of a sample (Tukey), 127
Information transfer in *S. typhimurium* (Sanderson), 1335
Insulin: as suppressor of hepatic enzyme biosynthesis (Weber *et al.*), 96; biosynthesis of two chains of (Humbel), 853
Integer and noninteger solutions to linear programs (Gomory), 260
Integration theory (Bogdanowicz), 492
Interferonlike inhibitors, endotoxin- and virus-induced, in rabbits (Ho and Kono), 220
Intermediate identification in trypsin-catalyzed reactions (Barman and Gutfreund), 1243
Internodes, action potential production by (Lorente de Nó and Honrubia), 757
Intrinsic analytic continuation (Bochner), 904
Intromission frequency and rat pregnancy (Wilson *et al.*), 1392
Ion transport induced in mitochondria (Pressman), 1076
Ionic Centrifuge and nuclear fusion (Slepian), 225
Isozymes, catalase, recombination of (Scandalios), 1035

JANKO, Z. A New Finite Simple Group with Abelian 2-Sylow Subgroups, 657
JEHLE, H. Replication of Double-Strand Nucleic Acids, 1451
JENSEN, R. *See* Davidson, N., 111
JOHNSON, W. S. *See* Biellmann, J. F., 891
JONES, D. S. *See* J. A. Carbon, 979
JONES, G. S. Stability and Asymptotic Fixed-Point Theory, 1262
JUVA, K. *See* Prockop, D. J., 661

KABAT, S. *See* Attardi, G., 1490
KAGIWADA, H. H. *See* Bellman, R. E., 907
———. *See* Bellman, R., 910
KAHAN, B. D. Isolation of a Soluble Transplantation Antigen, 153
KALABA, R. E. *See* Bellman, R. E., 907
———. *See* Bellman, R., 910
KALCKAR, H. M. *See* Mayer, H., 459
KAMMEN, H. O. *See* Canellakis, E. S., 184
KAMRIN, M., W. F. BERTSCH, and R. F. WOOD. Anilides and Phenylureas: Correlation between Calculated Pi-Electron Structure and Inhibition of Photosynthesis, 1118
KANNER, L. C. *See* Colvill, A. J. E., 1140
KAPLAN, N. O. *See* Chilson, O. P., 1006
Karyotype of mouse (Bennett), 730
KAUZMANN, W. *See* Krausz, L. M., 1234
KENDE, H. Kinetinlike Factors in the Root Exudate of Sunflowers, 1302
KENNEDY, B. J. *See* Yarbro, J. W., 1033
KERN, M. *See* Torres-Gallardo, J., 91
KHORANA, H. G. *See* Byrd, C., 79
Kinases in insect diapause (Brookes and Williams), 770
Kinetinlike factors in sunflower root exudate (Kende), 1302
KITTO, G. B. *See* Chilson, O. P., 1006
KJELLIN-STRÅBY, K., and H. G. BOMAN. Studies on Microbial RNA, III. Formation of Submethylated sRNA in *Saccharomyces cerevisiae*, 1346
KLEE, C. B., and L. SOKOLOFF. Amino Acid Incorporation into Proteolipid of Myelin *in vitro*, 1014
KLEIN, J. J., A. L. GOLDSTEIN, and A. WHITE. Enhancement of *in vivo* Incorporation of Labeled Precursors into DNA and Total Protein of Mouse Lymph Nodes after Administration of Thymic Extracts, 812
KLEIN, M. *See* Gelboin, H. V., 1353
KNIGHT, C. A. *See* Weissmann, C., 653
KOHN, K. W., N. H. STEIGBIGEL, and C. L. SPEARS. Cross-Linking and Repair of DNA in Sensitive and Resistant Strains of *E. coli* Treated with Nitrogen Mustard, 1154
KONO, Y. *See* Ho, M., 220
KOSOWER, E. M. The Therapeutic Possibilities Arising from the Chemical Modification of Proteins, 897
KOWAL, J. *See* Cremona, T., 1395
KRASTEFF, T. *See* Francis, T., Jr., 1061
KRAUSZ, L. M., and W. KAUZMANN. The Relationship between the Densitometric and Dilatometric Volume Changes of Ribonuclease Accompanying a Change in pH, 1234
KREISS, P. *See* Kuwabara S., 822
KRISMAN, C. R. *See* Mordoh, J., 86
KROHN, K., and J. RHODES. Results on Finite Semigroups Derived from the Algebraic Theory of Machines, 499
KUO, T.-C. A Family of Spectral Operations, 658
KUSHNER, H. J. On the Stability of Stochastic Dynamical Systems, 8, 1498
KUWABARA, S., M. J. CORMIER, L. S. DURE, P. KREISS, and P. PFUDERER. Crystalline Bacterial Luciferase from *Photobacterium fischeri*, 822
Lac-"operator negative" mutation in *E. coli* (Gartner and Orias), 62
Lactose operon in *E. coli*, enzyme induction in (Alpers and Tomkins), 797
LAIPIS, P. *See* Vinograd, J., 1104
Lambda DNA interaction sites (Cowie and Hershey), 57; (Hershey and Burgi), 325
Lambda infection in control of viral messenger RNA (Sly *et al.*), 378
LANGE, P. W. *See* Hydén, H., 946
LANNI, Y. T. DNA Transfer from Phage T5 to Host Cells: Dependence on Intercurrent Protein Synthesis, 969
Lanthanum staining properties (Doggenweiler and Frenk), 425
LARDY, H. A., V. PAETKAU, and P. WALTER. Paths of Carbon in Gluconeogenesis and Lipogenesis: The Role of Mitochondria in Supplying Precursors of Phosphoenolpyruvate, 1410
LAUFER, H., and Y. NAKASE. Salivary Gland Secretion and Its Relation to Chromosomal Puffing in the Dipteran, *Chironomus thummi*, 511
LAZZARINI, R. A., and A. PETERKOFSKY. The Characterization of a New Species of Leucyl-sRNA Formed during Methionine Deprivation of *Escherichia coli* with Relaxed Control, 549
LEACH, F. R. *See* Erhan, S., 646
Learning process and RNA response in neurons (Hydén and Lange), 946
Lebesgue-Bochner-Stieltjes integral (Bogdanowicz), 492
LE BOEUF, B. *See* Wilson, J. R., 1392
LEBOWITZ, J. *See* Vinograd, J., 1104
LECOMTE, J. R. *See* Bulen, W. A., 532
LEDER, P. *See* Trupin, J. S., 807
———. *See* Nirenberg, M., 1161
LEDERBERG, J. Topological Mapping of Organic Molecules, 134
LEIGH, E. G., JR. On the Relation between the Productivity, Biomass, Diversity, and Stability of a Community, 777
LEIVE, L. A Nonspecific Increase in Permeability in *Escherichia coli* Produced by EDTA, 745
LELOIR, L. F. *See* Mordoh, J., 86
LERNER, I. M. *See* Levene, H., 1042
LEUCHTENBERGER, C., R. LEUCHTENBERGER, T. BRUNNER, D. NORLIN, and S. WEISS. Transformation Induced by PR 8 Influenza Virus in Primary Cultures of Mouse Kidney and Bronchus, and Production of Malignant Kidney Tumors in Mice by Subcultures, 694
LEUCHTENBERGER, R. *See* Leuchtenberger, C., 694
Leucine coding degeneracy (Weisblum *et al.*), 328
Leucyl-sRNA from methionine deprivation of *E. coli* (Lazzarini and Peterkofsky), 549
Leukemia viruses, mouse, tissue culture assays for (Hartley *et al.*), 931
LEVENE, H., I. M. LERNER, A. SOKOLOFF, F. K. HO, and I. R. FRANKLIN. Genetic Load in Tribolium, 1042
LEVINE, E. M., Y. BECKER, C. W. BOONE, and H. EAGLE. Contact Inhibition, Macromolecular Synthesis, and Polyribosomes in Cultured Human Diploid Fibroblasts, 350

LEVINE, R. P., and R. K. TOGASAKI. A Mutant Strain of *Chlamydomonas reinhardi* Lacking Ribulose Diphosphate Carboxylase Activity, 987
Liapunov functions for Lur'e problem (Meyer), 501
LIAU, M. C., L. S. HNILICA, and R. B. HURLBERT. Regulation of RNA Synthesis in Isolated Nucleoli by Histones and Nucleolar Proteins, 626
Lifting disks and light open mappings (McAuley), 255
Light-induced luminescence (Gibson *et al.*), 187
Limit theorems for random mating in infinite populations (Ellison), 1266
Linear programs, solutions to (Gomory), 260
Linear second-order differential equations (Galbraith *et al.*), 247
LING, N.-S. *See* Francis, T., Jr., 1061
Lipid-phosphoacetylmuramyl-pentapeptide (Anderson *et al.*), 881
LIPMANN, F. *See* Bennett, T. P., 385
———. *See* Ganoza, M. C., 619
———. *See* Williams, C. A., 622
———. *See* Marchis-Mouren, G., 1147
Lipopolysaccharide, bacterial, biosynthesis of (Zeleznick *et al.*), 207
LIPSCOMB, W. N. *See* Hartsuck, J. A., 396
———. *See* Newton, M. D., 1089
Liquid mixtures, binary, application of significant structure theory to (Miner and Eyring), 1227
Liver mitochondria, volume changes in (Azzone and Azzi), 1084
LONGWORTH, J. W. *See* Rahn, R. O., 893
LORENTE DE NÓ, R., and V. HONRUBIA. Production of Action Potentials by the Internodes of Isolated Myelinated Nerve Fibers, 757
——— and V. HONRUBIA. Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, I, 938
——— and V. HONRUBIA. Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, II, 1384
LOWE, J. T. *See* Flygare, W. H., 576
Luciferase, crystalline bacterial (Kuwabara *et al.*), 822
LUDWIG, M. L. *See* Hartsuck, J. A., 396
LUNDEGÅRDH, H. The Influence of Diuron [3-(3,4-Dichlorophenyl)-1,1-Dimethylurea] on the Respiratory and Photosynthetic Systems of Plants, 703
Lur'e problem and Liapunov functions (Meyer), 501

Machine theory and finite semigroups (Krohn and Rhodes), 499
MACHINIST, J. M., and T. P. SINGER. Reactions of Coenzyme Q in the DPNH Dehydrogenase Segment of the Respiratory Chain, 467
MAGIROS, D. G. On Stability Definitions of Dynamical Systems, 1288
Magnetic circular dichroism (Schooley *et al.*), 579
MAJERUS, P. W., A. W. ALBERTS, and P. R. VAGELOS. Acyl Carrier Protein, IV. The Identification of 4′-Phosphopantetheine as the Prosthetic Group of the Acyl Carrier Protein, 410
MÄKELÄ, P. H. *See* Naide, Y., 147
Mammalian cell lines, collagen synthesis by (Green and Goldberg), 1360
Mammalian cells, clonal growth of, in synthetic medium (Ham), 288
Mannose, rhamnose, and galactose incorporation in *S. typhimurium* (Zeleznick *et al.*), 207
MANSOUR, A. M., and M. C. NIU. Functional Studies with Uterine RNA, 764
Mappings: light open, and lifting disks (McAuley), 255; noncompact, in Hilbert space (Browder), 1272
MARCHIS-MOUREN, G., and F. LIPMANN. On the Mechanism of Acetylation of Fetal and Chicken Hemoglobins, 1147
MARGULIES, A. D. *See* Clark, A. J., 451
MARKS, P. A., E. R. BURKA, F. M. CONCONI, W. PERL, and R. A. RIFKIND. Polyribosome Dissociation and Formation in Intact Reticulocytes with Conservation of Messenger Ribonucleic Acid, 1437
MARSHALL, L. C. *See* Berkner, L. V., 1215
MARSHALL, R. *See* Pestka, S., 639
Martingales, continuous (Dubins and Schwarz), 913
MARVER, H. S. *See* Tschudy, D. P., 841
Mass of potential energy (Brillouin), 475, 1280
MATHEWS, H. T. Cluster Sets at Isolated and Nonisolated Singularities, 1264
MATSUHASHI, M. *See* Anderson, J. S., 881
Matter, spherically symmetric distributions of, without pressure (Omer), 1
MAUSER, LJ. *See* Reddi, K. K., 607
MAYER, H., A. M. C. RAPIN, and H. M. KALCKAR. The Selectivity of Biosynthesis of Glucosyl Compounds as Illustrated by an *E. coli* Mutant Defective in UDPG Synthetase, 459
McAULEY, L. F. Lifting Disks and Certain Light Open Mappings, 255
McCAPRA, F. *See* Money, T., 901
McCONNELL, H. M., B. M. HOFFMAN, and R. M. METZGER. Charge Transfer in Molecular Crystals, 46
McSHANE, E. J. *See* Galbraith, A. S., 247
Membrane potentials and resistance in squid giant axons (Rojas), 306
Membrane subunits, assembly of (Green and Hechter), 318
Membrane transport intermediates in cell wall synthesis (Anderson *et al.*), 881
Membranes, anesthetic action on (Agin *et al.*), 952
MENGER, F. *See* Bender, M. L., 711
Messenger RNA: control of viral (Sly *et al.*), 378; reading of, during protein synthesis (Eikenberry and Rich), 688; conservation of, during polyribosome dissociation (Marks *et al.*), 1437
Metal ion interaction with polynucleotides (Eichhorn and Clark), 586
Methyl ether cyclizations (Brust *et al.*), 233
Methyl group, *A*-value of (Biellmann and Johnson), 891
METZGER, R. M. *See* McConnell, H. M., 46

MEYER, K. R. Liapunov Functions for the Problem of Lur'e, 501
Mice, production of malignant kidney tumors in (Leuchtenberger *et al.*), 694
MICHEL, M. R. *See* Weil, R., 1468
MICHELSON, A. M. *See* Pochon, F., 1425
Microbial RNA (Kjellin-Strâby and Boman), 1346
Microclimatic and vegetational contrasts, subalpine (Clausen), 1315
MINER, B. A., and H. EYRING. The Application of Significant Structure Theory to Binary Liquid Mixtures: $Ar + N_2$, $Ar + O_2$, and $O_2 + N_2$, 1227
Mitochondria: calcium reactions with (Rasmussen *et al.*), 1069; induced ion transport in (Pressman), 1076; liver, volume changes in (Azzone and Azzi), 1084; chick embryo, DNA isolation from (Rabinowitz *et al.*), 1126; supplying phosphoenolpyruvate precursors (Lardy *et al.*), 1410
Mitochondrion compartmentation (Brierley and Green), 73
MITTERMAYER, C. *See* Braun, R., 924
MIYAGI, M. *See* Flickinger, R. A., 783
Molecular complexes of flavins and phenols (Fleischman and Tollin), 237
Molecular orbital Hartree-Fock theory (Newton *et al.*), 1089
Molecular sieve chromatography and stoichiometry determination (Ackers and Thompson), 342
Molecular size and circularity of DNA in mammalian and plant cells (Hotta and Bassel), 356
MONEY, T., I. G. WRIGHT, F. MCCAPRA, and A. I. SCOTT. Biosynthesis of the Indole Alkaloids, 901
MOOHR, J. W. *See* Hsu, W.-T., 517
MOON, M. W. *See* Byrd, C., 79
MORALES, D. R. *See* Canellakis, E. S., 184
MORDOH, J., L. F. LELOIR, and C. R. KRISMAN. *In vitro* Synthesis of Particulate Glycogen, 86
MOSER, C. *See* Flickinger, R. A., 783
MOSS, T. H. *See* Bearden, A. J., 1246
Mössbauer spectroscopy of heme (Bearden *et al.*), 1246
MOUDRIANAKIS, E. N., and M. BEER. Base Sequence Determination in Nucleic Acids with the Electron Microscope, III. Chemistry and Microscopy of Guanine-Labeled DNA, 564
Mouse karyotype (Bennett), 730
Mouse liver cell-free system in protein synthesis (Williams *et al.*), 622
Mouse lymph nodes, protein of (Klein *et al.*), 812
Mouse skin tumorigenesis inhibited by actinomycin D (Gelboin *et al.*), 1353
MUIRHEAD, H. *See* Hartsuck, J. C., 396
Mutant of polyoma virus, temperature-sensitive, transforming ability of (Fried), 486
Mutations: X-ray-induced, in *N. crassa* (Webber and de Serres), 430; at incompatibility loci in *Schizophyllum* (Raper *et al.*), 1324
Myelin proteolipid, amino acid incorporation into (Klee and Sokoloff), 1014
Myelinated nerve fibers (Lorente de Nó and Honrubia), 757, 938, 1384
MYERS, D. V., and J. T. EDSALL. Optical Rotatory Dispersion of Human Carbonic Anhydrases: Cotton Effects and Aromatic Absorption Bands, 169

NAIDE, Y., H. NIKAIDO, P. H. MÄKELÄ, R. G. WILKINSON, and B. A. D. STOCKER. Semirough Strains of *Salmonella*, 147
NAKASE, Y. *See* Laufer, H., 511
NANDI, U. S. *See* Davidson, N., 111
NATIONAL ACADEMY OF SCIENCES. Symposium on the Evolution of the Earth's Atmosphere, 1169
NEIDHARDT, F. C. *See* Eidlic, L., 539
Nerve cell RNA and synaptic sites (Bodian), 418
Nerve fibers: action potential production by (Lorente de Nó and Honrubia), 757; action currents in (Lorente de Nó and Honrubia), 938, 1384
Neuronal RNA, response of during learning (Hydén and Lange), 946
Neurospora crassa: mutations in *ad-3* region o- (Webber and de Serres), 430; phenylf alanyl-sRNA synthetases in (Imamoto *et al.*), 1456
Neurospora enzyme fractionation in aminoacylation (Barnett), 1462
NEWTON, M. D., F. P. BOER, W. E. PALKE, and W. N. LIPSCOMB. Nonempirical Molecular Orbital Theory from Molecular Hartree-Fock Theory, 1089
NEY, R. L. *See* Garren, L. D., 1443
NIKAIDO, H. *See* Naide, Y., 147
NIRENBERG, M., P. LEDER, M. BERNFIELD, R. BRIMACOMBE, J. TRUPIN, F. ROTTMAN, and C. O'NEAL. RNA Codewords and Protein Synthesis, VII. On the General Nature of the RNA Code, 1161
———. *See* Pestka, S., 639
———. *See* Trupin, J. S., 807
NISHIMURA, S., and G. D. NOVELLI. Dissociation of Amino Acid Acceptor Function of sRNA from Its Transfer Function, 178
Nitrogen fixation (Bulen *et al.*), 532
Nitrogen mustard and DNA cross-linking (Kohn *et al.*), 1154
NIU, M. C. *See* Mansour, A. M., 764
Nonchromosomal gene recombination in *Chlamydomonas* (Sager and Ramanis), 1053
Nonlinear elliptic partial differential equations (Berger), 1277
Nonlinear equations, periodic solutions for (Browder), 1100
NORLIN, D. *See* Leuchtenberger, C., 694
NORTHRUP, L. G. *See* Erhan, S., 646
NOVELLI, G. D. *See* Nishimura, S., 178
Nuclear fusion and Ionic Centrifuge (Slepian), 225
Nuclear quadrupole and spin-rotation interaction of O^{17} in formaldehyde (Flygare and Lowe), 576
Nuclei and chromosomes in honeybee cells (DuPraw), 161
Nucleic acid replication (Jehle), 1451
Nucleic acid sequence determination (Moudrianakis and Beer), 564

Nucleoli, histone regulation of RNA synthesis in (Liau *et al.*), 626
Nucleotide sequences of RNA codons (Trupin *et al.*), 807

Ocean water, history of, and chemistry of earth's atmosphere (Holland), 1173
OCHOA, S. *See* Weissmann, C., 653
OGATA, E. *See* Rasmussen, H., 1069
OGONIAK, J. C., and P. N. SAWYER. The Electrochemical Precipitation of Fibrinogen, 572
———. *See* Sawyer, P. N., 200
OHTSUKA, E. *See* Byrd, C., 79
Oligonucleotide binding of aminoacyl-sRNA's (Thach and Sundararajan), 1021
Oligonucleotide fragments of alanine RNA (Apgar *et al.*), 546
OLIVERA, B. M. *See* Davidson, N., 111
OMER, G. C., JR. Spherically Symmetric Distributions of Matter without Pressure, 1
O-(α-methylallyl) phenol cyclizations (Brust *et al.*), 233
O'NEAL, C. *See* Nirenberg, M., 1161
Operators, commutators of singular integral (Calderón), 1092
Operon, histidine, in linkage map of *S. typhimurium* (Hartman *et al.*), 1332
Optical activity in cystine-containing proteins (Beychok), 999
Optical detection of transients in trypsin-catalyzed reactions (Bernhard and Gutfreund), 1238
Optical rotatory dispersion of: human carbonic anhydrases (Myers and Edsall), 169; polypeptides and proteins (Yang), 438; chlorophyll (Sauer), 716
Orbital theory, molecular (Newton *et al.*), 1089
Organic molecules, topological mapping of (Lederberg), 134
Organic volatiles in the atmosphere (Rasmussen and Went), 215
ORIAS, E. *See* Gartner, T. K., 62
OSBORN, M. J. *See* Zeleznick, L. D., 207
Oscillations of Earth, asymptotic theory of (Pekeris), 1254
Overcompensation, redesign (Zener), 242
Oxidative inactivation of transfer RNA (Carbon *et al.*), 1294
ÖZARSLAN, S. *See* Bloom, W., 1294

PAETKAU, V. *See* Lardy, H. A., 1410
PALKE, W. E. *See* Newton, M. D., 1089
Paramecium aurelia, cell cortex in (Beisson and Sonneborn), 275
PARRISH, G. B. *See* Galbraith, A. S., 247
PARSON, W. W., and H. RUDNEY. An Intermediate in the Conversion of p-Hydroxybenzoate-U-C^{14} to Ubiquinone in *Rhodospirillum rubrum*, 599
Particulate glycogen, synthesis of (Mordoh *et al.*), 86
PATAKI, J. *See* Huggins, C., 791
PEARLSTEIN, R. M. A Two-Quantasome Theory of Chlorophyll-a Fluorescence in Green Plant Photosynthesis, 702
PEKERIS, C. L. Asymptotic Theory of the Free Torsional Oscillations of the Earth, 1254
PENSWICK, J. R., and R. W. HOLLEY. Specific Cleavage of the Yeast Alanine RNA into Two Large Fragments, 543
Peptides containing tyrosyl residues of carboxypeptidase A (Roholt *et al.*), 847
Periodic solutions for nonlinear equations of evolution (Browder), 1100
Periodicities, hidden (Bellman *et al.*), 907
PERL, W. *See* Marks, P. A., 1437
PERLROTH, M. G. *See* Tschudy, D. P., 841
Permeability increase in *E. coli* by EDTA (Leive), 745
PESTKA, S., R. MARSHALL, and M. NIRENBERG. RNA Codewords and Protein Synthesis, V. Effect of Streptomycin on the Formation of Ribosome-sRNA Complexes, 639
PETERKOFSKY, A. *See* Lazzarini, R. A., 549
PETERKOFSKY, B., and S. UDENFRIEND. Enzymatic Hydroxylation of Proline in Microsomal Polypeptide Leading to Formation of Collagen, 335
PFUDERER, P. *See* Kuwabara, S., 822
Phage λ, interaction sites in DNA of (Cowie and Hershey), 57
Phage T5, DNA transfer to host cells from (Lanni), 969
Phagocytosis of antigen (Frei *et al.*), 20
Pharmacological support for man during space flights (Schmidt), 1365
Phenols and flavins, molecular complexes of (Fleischman and Tollin), 38, 237
Phenylalanyl-sRNA synthetases in *N. crassa* (Imamoto *et al.*), 1456
Phenylureas and anilides (Kamrin *et al.*), 1118
Phosphatidylinositol synthesis in cervical ganglion (Hokin), 1369
4′-Phosphopantetheine as prosthetic group of ACP (Majerus *et al.*), 410
Photobacterium fischeri crystalline bacterial luciferase (Kuwabara *et al.*), 822
Photoreactivable lesions in DNA (Setlow *et al.*), 1430
Photoreduction of ferredoxin in CO_2 fixation by photosynthetic bacterium (Evans and Buchanan), 1420
Photosynthesis: green plant, chlorophyll-a fluorescence in (Pearlstein), 702; inhibition in anilides and phenylureas (Kamrin *et al.*), 1118; plastocyanin in (Fork and Urbach), 1307
Photosynthetic bacterium (Evans and Buchanan), 1420
Photosynthetic plant systems, diuron influence on (Lundegårdh), 703
Physarum polycephalum, DNA replication in (Braun *et al.*), 924
Plastocyanin in photosynthesis (Fork and Urbach), 1307
Platelets, mammalian, electrochemical precipitation of, and intravascular thrombosis (Sawyer *et al.*), 200
Pleiotropic effects of suppressors of mutation in *E. coli* (Gartner and Orias), 62
POCHON, F., and A. M. MICHELSON. Polynucleotides, VI. Interaction between Polyguanylic Acid, and Polycytidylic Acid, 1425
Polycyclic aromatic hydrocarbons in bacteriophage development (Hsu *et al.*), 517

Polyguanylic and polycytidylic acids, interactions between (Pochon and Michelson), 1425
Polymer molecule conformation at an interface (Roe), 50
Polynucleotide interactions with metal ions (Eichhorn and Clark), 586
Polynucleotides (Pochon and Michelson), 1425
Polyoma viral DNA, twisted circular form of (Vinograd *et al.*), 1104
Polyoma virus in induction of cellular DNA synthesis (Dulbecco *et al.*), 403, 890; (Weil *et al.*), 1468
Polyoma virus, temperature-sensitive mutant of (Fried), 486
Polypeptides and proteins, optical rotatory dispersion of (Yang), 438
Polyribosome dissociation and formation in intact reticulocytes (Marks *et al.*), 1437
Porphyria, acute intermittent (Tschudy *et al.*), 841
Potassium-activated *p*-nitrophenylphosphatase in rat brain (Albers *et al.*), 557
Potential energy and relativity (Brillouin), 475, 1280
Pregnancy, rat, intromission frequency effects on (Wilson *et al.*), 1392
PRESSMAN, B. C. Induced Active Transport of Ions in Mitochondria, 1076
PRESSMAN, D. *See* Roholt, O. A., 847
PRINTZ, M. P., and P. H. VON HIPPEL. Hydrogen Exchange Studies of DNA Structure, 363
PROCKOP, D. J., and K. JUVA. Synthesis of Hydroxyproline *in vitro* by the Hydroxylation of Proline in a Precursor of Collagen, 661
Productivity, biomass, diversity, and stability of community (Leigh), 777
Programing, dynamic, in play of chess and checkers (Bellman), 244
Programs, linear, solutions to (Gomory), 260
Proline hydroxylation: in microsomal polypeptide (Peterkofsky and Udenfriend), 335; in collagen precursor (Prockop and Juva), 661
Prosthetic group of ACP (Majerus *et al.*), 410
Proteases, injected, affecting axon membrane potentials and resistance (Rojas), 306
Protein(s): optical rotatory dispersion of (Yang), 438; nucleolar, in RNA synthesis (Liau *et al.*), 626; structure and disulfide interchange (Givol *et al.*), 676; human serum group-specific (Bowman and Bern), 722; transformation, therapeutic possibilities of (Kosower), 897; brain, synthesis of (Rubin and Stenzel), 963; side-chain optical activity in (Beychok), 999
Protein synthesis: and leucine coding degeneracy (Weisblum *et al.*), 328; inhibited by chlortetracycline (Hierowski), 594; by cell-free systems (Ganoza *et al.*), 619, (Williams *et al.*), 622; mRNA reading during (Eikenberry and Rich), 668; and T5 DNA transfer (Lanni), 969; by reticulocyte ribosomes (Wolfe and Weisberger), 991; in corticosterone production (Garren *et al.*), 1443
Proteolipid, myelin, amino acid incorporation into (Klee and Sokoloff), 1014
PRUDEN, B., W. SNIPES, and W. GORDY. Electron Spin Resonance of an Irradiated Single Crystal of Thymidine, 917
———. *See* Gordy, W., 751
Puffing, chromosomal, of dipteran salivary gland (Laufer and Nakase), 511
Pyrimidine biosynthesis in *S. marcescens* (Hayward and Belser), 1483
Pyrimidine dimers in UV-irradiated poly dI:dC (Setlow *et al.*), 1111

RABINOWITZ, M., J. SINCLAIR, L. DESALLE, R. HASELKORN, and H. H. SWIFT. Isolation of Deoxyribonucleic Acid from Mitochondria of Chick Embryo Heart and Liver, 1126
Rabbit embryo skin, hydroxyproline formation in (Bekhor and Bavetta), 613
Rabbits: hemolysin after radiation of (Taliaferro and Taliaferro), 139; interferonlike inhibitions in (Ho and Kono), 220
Radiation effects on DNA (Gordy *et al.*), 751
Radiation enhancement of hemolysin in rabbits (Taliaferro and Taliaferro), 139
Radiative transfer (Bellman *et al.*), 910
RADLOFF, R. *See* Vinograd, J., 1104
RADZIMSKI, G. *See* Roholt, O. A., 847
RAHN, R. O., R. G. SHULMAN, and J. W. LONGWORTH. The UV-Induced Triplet State in DNA, 893
RAINS, D. W. *See* Epstein, E., 1320
RAMANIS, Z. *See* Sager, R., 1053
Random mating in infinite populations, limit theorems for (Ellison), 1266
RAPER, C. A. *See* Raper J. R., 1324
RAPER, J. R., D. H. BOYD, and C. A. RAPER. Primary and Secondary Mutations at the Incompatibility Loci in *Schizophyllum*, 1324
RAPIN, A. M. C. *See* Mayer, H., 459
RASMUSSEN, H., B. CHANCE, and E. OGATA. A Mechanism for the Reactions of Calcium with Mitochondria, 1069
———. *See* Tenenhouse, A., 818
RASMUSSEN, R. A., and F. W. WENT. Volatile Organic Material of Plant Origin in the Atmosphere, 215
Rat brain, subcellular localizations of ATPase in (Albers *et al.*), 557
Rat liver cell-free system in protein synthesis (Ganoza *et al.*), 619
Rat pineal gland, circadian rhythm in serotonin content of (Snyder *et al.*), 301
Rat pregnancy, intromission frequency effects on (Wilson *et al.*), 1392
RAY, A. K., and J. B. S. HALDANE. The Genetics of a Common Indian Digital Abnormality, 1050
REARDON, J. H. *See* Sawyer, P. N., 200
Receptors, serotonin (Woolley and Gommi), 959
RECHCIGL, M., JR. *See* Tschudy, D. P., 841
Recombination-deficient mutants of *E. coli* K12 (Clark and Margulies), 451
Recombination of nonchromosomal genes in *Chlamydomonas* (Sager and Ramanis), 1053
REDDI, K. K., and LJ. MAUSER. Studies on the Formation of Tobacco Mosaic Virus Ribonucleic Acid, VI. Mode of Degrada-

tion of Host Ribonucleic Acid to Ribonucleosides and Their Conversion to Ribonucleoside 5′-Phosphates, 607
Redesign overcompensation (Zener), 242
Relativity and potential energy (Brillouin), 475
Replication of DNA: in *P. polycephalum* (Braun *et al.*), 924; and crossing-over in Drosophila oöcyte (Grell and Chandley), 1340
Replication of double-strand nucleic acids (Jehle), 1451
RESNIKOFF, H. L. A Differential Equation for the Theta Function, 692
Respiration and photosynthesis of plants, influence of diuron on (Lundegårdh), 703
Reticulocyte ribosomes, protein synthesis by (Wolfe and Weisberger), 991
Retinal rod, ultrastructure of (Robertson), 860
RHODES, J. *See* Krohn, K., 499
Rhodospirillum rubrum (Bulen *et al.*), 532; (Parson and Rudney), 599
Ribonuclease volume change with pH change (Krausz and Kauzmann), 1234
Ribonucleosides, TMV-RNA degradation to (Reddi and Mauser), 607
Ribosomal component, 50S, of *E. coli* (Hart), 1415
Ribulose diphosphate carboxylase activity lacking in *C. reinhardi* (Levine and Togasaki), 987
RICE, S. A. *See* Hillier, I. H., 973
RICH, A. *See* Eikenberry, E. F., 668
Riemannian spaces (Sario and Fukuda), 270
RIFKIND, R. A. *See* Marks, P. A., 1437
RITOSSA, F. M., and S. SPIEGELMAN. Localization of DNA Complementary to Ribosomal RNA in the Nucleolus Organizer Region of *Drosophila melanogaster*, 737
RNA: metabolism correlated with genetic activity and heterochromatization (Berlowitz), 68; control of viral messenger after lambda phage infection (Sly *et al.*), 378; synaptic sites and nerve cell (Bodian), 418; TMV-, formation of (Reddi and Mauser), 607; viral, replication of (Weissmann *et al.*), 653; localization of DNA complementary to (Ritossa and Spiegelman), 737; uterine (Mansour and Niu), 764; neuron, response during learning (Hydén and Lange), 946; nature of code of (Nirenberg *et al.*), 1161; microbial (Kjellin-Stråby and Boman), 1346; messenger, conservation of in polyribosome dissociation (Marks *et al.*), 1437; ribosomal sites in DNA (Attardi *et al.*), 1490
RNA, alanine: cleavage of (Penswick and Holley), 543; oligonucleotide fragments of (Apgar *et al.*), 546
RNA codewords and protein synthesis (Pestka *et al.*), 639; (Trupin *et al.*), 807; (Nirenberg *et al.*), 1161
RNA synthesis: regulation of, by histones (Liau *et al.*), 626; chromatin and DNA as primers in (Flickinger *et al.*), 783; asymmetric (Colvill *et al.*), 1140
ROBERTSON, J. D. A Possible Ultrastructural Correlate of Function in the Frog Retinal Rod, 860
RODE, L. J., and J. W. FOSTER. Gaseous Hydrocarbons and the Germination of Bacterial Spores, 31
ROE, R.-J. Conformation of an Isolated Polymer Molecule at an Interface, 50
ROHOLT, O. A., G. RADZIMSKI, and D. PRESSMAN. Peptides Containing the Functional Tyrosyl Residues of the Active Center of Bovine Pancreatic Carboxypeptidase A, 847
ROJAS, E. Membrane Potentials, Resistance, and Ion Permeability in Squid Giant Axons Injected or Perfused with Proteases, 306
ROLLINS, E. *See* Flickinger, R. A., 783
Root exudate, sunflower (Kende), 1302
ROSEN, S. M. *See* Zeleznick, L. D., 207
ROSENBERG, E. D-Mannose as a Constituent of the DNA of a Mutant Strain of a Bacteriophage SP8, 836
ROSENCRANS, S. On the Propagation of Energy in a Stratified Gaseous Medium, 249
ROTTMAN, F. M. *See* Trupin, J. S., 807
———. *See* Nirenberg, M., 1161
ROWE, W. P. *See* Hoggan, M. D., 12
———. *See* Hartley, J. W., 931
RUBIN, A. L., and K. H. STENZEL. *In vitro* Synthesis of Brain Protein, 963
RUDNEY, H. *See* Parson, W. W., 599
RUSCH, H. P. *See* Braun, R., 924
RUSCHMANN, G. K. *See* Weil, R., 1468
RUSGIS, C. *See* Hartman, P. E., 1332

SAGER, R., and Z. RAMANIS. Recombination of Nonchromosomal Genes in *Chlamydomonas*, 1053
Salivary gland secretion and puffing in dipteran (Laufer and Nakase), 511
Salmonella, semirough strains of (Naide *et al.*), 147
Salmonella typhimurium: incorporation of mannose, rhamnose, and galactose in (Zeleznick *et al.*), 207; histidine operon in linkage map of (Hartman *et al.*), 1332; information transfer in (Sanderson), 1335
SALTMARSH-ANDREW, M. *See* Zeleznick, L. D., 207
Sample informativeness (Tukey), 127
SANDERSON, K. E. Information Transfer in *Salmonella typhimurium*, 1335
Sarcomere length, frog skeletal, and adenosine-triphosphate activity (Ward *et al*), 1377
SARIO, L., and N. FUKUDA. Harmonic Functions with Given Values and Minimum Norms in Riemannian Spaces, 270
SARNAT, M. T. *See* Colvill, A. J. E., 1140
SAUER, K. Optical Rotatory Dispersion of Chlorophyll in Solution and in Chloroplast Subunits, 716
SAVAGE, L. J. *See* Dubins, L. E., 274
SAWYER, P. N., J. H. REARDON, and J. C. OGONIAK. Irreversible Electrochemical Precipitation of Mammalian Platelets and Intravascular Thrombosis, 200
———, K.-T. WU, S. A. WESOLOWSKI, W. H. BRATTAIN, and P. J. BODDY. Electrochemical Precipitation of Blood Cells on Metal Electrodes: An Aid in the Selection of Vascular Prostheses? 294
———. *See* Ogoniak, J. C., 572

SCANDALIOS, J. G. Subunit Dissociation and Recombination of Catalase Isozymes, 1035
Schizophyllum, mutations at incompatibility loci in (Raper *et al.*), 1324
SCHMIDT, C. F. Pharmacological Support for Man on Long Space Flights, 1365
SCHNEIDER, M. C. *See* Weissmann, C., 653
SCHOOLEY, D. A., E. BUNNENBERG, and C. DJERASSI. Magnetic Circular Dichroism Studies: A Preliminary Report, 579
SCHWARTZ, J. H., J. M. EISENSTADT, G. BRAWERMAN, and N. D. ZINDER. Biosynthesis of the Coat Protein of Coliphage f2 by Extracts of *Euglena gracilis*, 195
———. An Effect of Streptomycin on the Biosynthesis of the Coat Protein of Coliphage f2 by Extracts of *E. coli*, 1133
SCHWARZ, G. *See* Dubins, L. E., 913
SCOTT, A. I. *See* Money, T., 901
Sea urchin sperm, chromatin structure in (Solari), 503
Semigroups, finite (Krohn and Rhodes), 499
Semilethals, synthetic, in Drosophila (Dobzhansky *et al.*), 482
Semiquinone hydriodide complexes (Fleischman and Tollin), 237
Semirough strains of *Salmonella* (Naide *et al.*), 147
Serotonin content, pineal, circadian rhythm in (Snyder *et al.*), 301
Serotonin receptors (Woolley and Gommi), 959
Serratia marcescens, pyridine biosynthesis in (Hayward and Belser), 1483
Serum globulin and cholesterol interaction (Francis *et al.*), 1061
Serum group-specific protein (Bowman and Bearn), 722
SETLOW, J. K., M. E. BOLING, and F. J. BOLLUM. The Chemical Nature of Photoreactivable Lesions in DNA, 1430
SETLOW, R. B., W. L. CARRIER, and F. J. BOLLUM. Pyrimidine Dimers in UV-Irradiated Poly dI:dC, 1111
Sets, cluster, at singularities (Mathews), 1264
SHAPIRO, D. M., J. EIGNER, and G. R. GREENBERG. Inability of Thymine-Dependent Mutants of Bacteriophage T4 to Induce Thymidylate Synthetase, 874
SHULMAN, R. G. *See* Rahn, R. O., 893
Significant structure theory applied to binary liquid mixtures (Miner and Eyring), 1227
SILVER, S. Acriflavine Resistance: A Bacteriophage Mutation Affecting the Uptake of Dye by the Infected Bacterial Cells, 24
ŠIMON, A. Advances in Fusion Research, 866
SINCLAIR, J. *See* Rabinowitz, M., 1126
SINGER, T. P. *See* Machinist, J. M., 467
SINGHAL, R. L. *See* Weber, G., 96
Singular integral operators, commutators of (Calderón), 1092
Singularities, cluster sets at (Mathews), 1264
SLEPIAN, J. The Ionic Centrifuge and Fusion Nuclear Power, 225
SLY, W. S., H. ECHOLS, and J. ADLER. Control of Viral Messenger RNA after Lambda Phage Infection and Induction, 378
SNIPES, W. *See* Gordy, W., 751
———. *See* Pruden, B., 917
SNYDER, S. H., M. ZWEIG, J. AXELROD, and J. E. FISCHER. Control of the Circadian Rhythm in Serotonin Content of the Rat Pineal Gland, 301
Sodium-potassium-activated ATPase in rat brain (Albers *et al.*), 557
SOKOLOFF, A. *See* Levene, H., 1042
SOKOLOFF, L. *See* Klee, C. B., 1014
SOLARI, A. J. Structure of the Chromatin in Sea Urchin Sperm, 503
Solenoid lenses, high-field superconducting, in electron microscopy (Fernández-Morán), 445
Somatic cell hybridization (Ephrussi and Weiss), 1040
SONNEBORN, T. M. *See* Beisson, J., 275
Space flights, pharmacological support for man during (Schmidt), 1365
SPASSKY, B. *See* Dobzhansky, T., 482
SPEARS, C. L. *See* Kohn, K. W., 1154
Specific antibody activity after complete unfolding (Whitney and Tanford), 524
Spectral operations (Kuo), 658
Spectroscopy of heme (Bearden *et al.*), 1246
Spectrum of time correlation function matrix for stochastic processes (Andrews), 1284
Sperm chromatin of sea urchin (Solari), 503
Spherically symmetric distributions of matter without pressure (Omer), 1
SPIEGELMAN, S. *See* Ritossa, F. M., 737
Spin-rotation interaction of O^{17} in formaldehyde (Flygare and Lowe), 576
Spore germination and gaseous hydrocarbons (Rode and Foster), 31
Squid giant axons (Rojas), 306
SRIVASTAVA, S. K. *See* Weber, G., 96
sRNA: periodate-oxidized, valine acylation inhibition by (Torres-Gallardo and Kern), 91; acceptor and transfer functions of (Nishimura and Novelli), 178; hydrogen exchange in (Englander and Englander), 370; coding and charging specificities of (Bennett *et al.*), 385; synthetase, valyl-, in enzyme repression (Eidlic and Neidhardt), 539; leucyl-, from methionine deprivation of *E. coli* (Lazzarini and Peterkofsky), 549; reversible oxidative inactivation of (Carbon *et al.*), 979; aminoacyl-, binding of (Thach and Sundararajan), 1021; formation of submethylated (Kjellin-Strâby and Boman), 1346; phenylalanyl synthetases of (Imamoto *et al.*), 1456; formation of aminoacyl- (Barnett), 1462
Stability and asymptotic fixed-point theory (Jones), 1262
Stability definitions of dynamical systems (Magiros), 1288
Stability of community (Leigh), 777
Stability of stochastic dynamical systems (Kushner), 8, 1498
STAHL, R. C. *See* Hartman, P. E., 1332
Staining properties of lanthanum (Doggenweiler and Frenk), 425
STEIGBIGEL, N. H. *See* Kohn, K. W., 1154
STEITZ, T. A. *See* Hartsuck, J. A., 396
STENZEL, K. H. *See* Rubin, A. L., 963
Stochastic dynamical systems (Kushner), 8, 1498
Stochastic processes (Dubins and Savage), 274; time correlation function matrix for (Andrews), 1284
STOCKER, B. A. D. *See* Naide, Y., 147

Stoichiometry determination by molecular sieve chromatography (Ackers and Thompson), 342
Stratified gaseous medium, energy propagation in (Rosencrans), 249
Streptomycin effect on biosynthesis of f2 coliphage by *E. coli* (Schwartz), 1133
Streptomycin in formation of ribosome-sRNA complexes (Pestka *et al.*), 639
STROMINGER, J. L. *See* Anderson, J. S., 881
Sturm-Liouville theorem for nonlinear elliptic partial differential equations (Berger), 1277
Subalpine microclimatic and vegetational contrasts (Clausen), 1315
SUEOKA, N. *See* Imamoto, F., 1456
SUNDARARAJAN, T. A. *See* Thach, R. E., 1021
Sunflower root exudate, kinetinlike factors in (Kende), 1302
Suppressor mutations in *E. coli* (Gartner and Orias), 62
SV40-induced complement-fixing antigen (Gilden *et al.*), 684
SWIFT, H. H. *See* Rabinowitz, M., 1126
2-Sylow subgroups, abelian (Janko), 657
Symmetric distributions of matter (Omer), 1
Synaptic sites and nerve cell RNA (Bodian), 418
Systems identification and unscrambling of data (Bellman *et al.*), 907, 910
Synthetase, carbamyl phosphate, biosynthesis of (Tatibana and Cohen), 104
Synthetase, thymidylate, induction by T4 phage mutants (Shapiro *et al.*), 874

TAGUCHI, F. *See* Gilden, R. V., 684
TALIAFERRO, L. G. *See* Taliaferro, W. H., 139
TALIAFERRO, W. H., and L. G. TALIAFERRO. Enhancement of Natural Hemolysin in Adult Rabbits after Radiation, 139
TANFORD, C. *See* Whitney, P. L., 524
TARBELL, D. S. *See* Brust, D. P., 233
TATIBANA, M., and P. P. COHEN. Formation and Conversion of Macromolecular Precursor(s) in the Biosynthesis of Carbamyl Phosphate Synthetase, 104
Tchebycheff-like inequality for stochastic processes (Dubins and Savage), 274
TENENHOUSE, A., C. ARNAUD, and H. RASMUSSEN. The Isolation and Characterization of Thyrocalcitonin, 818
THACH, R. E., and T. A. SUNDARARAJAN. The Binding of Aminoacyl-sRNA's to Ribosomes Stimulated by Block Oligonucleotides, 1021
Therapeutic possibilities of protein transformation (Kosower), 897
Theta function, differential equation for (Resnikoff), 692
THOMAS, T. Y. Galactic Discretization and the Future of the Universe, 227
THOMPSON, T. E. *See* Ackers, G. K., 342
THORBECKE, G. J. *See* Frei, P. C., 20
Thrombosis, intravascular, and platelet electrochemical precipitation (Sawyer *et al.*), 200
Thue system (Boone), 265
Thymic extracts in promotion of lymph node proliferation in mice (Klein *et al.*), 812
Thymidine crystal, election spin resonance of (Pruden *et al.*), 917
Thymidine kinase in insect diapause (Brookes and Williams), 770
Thymidine-3′-triphosphate, enzymic synthesis of (Canellakis *et al.*), 184
Thymine-dependent mutants of T4 bacteriophage (Shapiro *et al.*), 874
Thyrocalcitonin, isolation and characterization of (Tenenhouse *et al.*), 818
Time correlation function matrix for stochastic processes (Andrews), 1284
Tobacco mosaic virus RNA: formation of (Reddi and Mauser), 607; nucleotide composition of (Weissmann *et al.*), 653
TOCCHINI-VALENTINI, G. P. *See* Colvill, A. J. E., 1140
TOGASAKI, R. K. *See* Levine, R. P., 987
TOLLIN, G. *See* Fleischman, D. E., 38, 237
TOMKINS, G. M. *See* Alpers, D. H., 797
Topological mapping of organic molecules (Lederberg), 134
TORRES-GALLARDO, J., and M. KERN. The Specific Inhibition of the Enzymatic Aminoacylation of Valyl- and Tyrosyl-sRNA by Periodate-Oxidized sRNA, 91
T4 phage mutants and dTMP synthetase (Shapiro *et al.*), 874
Transcholesterin (Francis *et al.*), 1061
Transfer and acceptor functions of sRNA (Nishimura and Novelli), 178
Transfer, information, in *S. typhimurium* (Sanderson), 1335
Transformation induced by influenza virus (Leuchtenberger *et al.*), 694
Transforming ability of polyoma virus mutant (Fried), 486
Translocation of mouse karyotype (Bennett), 730
Transplantation antigen, soluble (Kahan), 153
Transport, carrier-mediated cation, in barley roots (Epstein and Rains), 1320
Tribolium, genetic load in (Levene *et al.*), 1042
Triplet state, UV-induced, in DNA (Rahn *et al.*), 893
TRUPIN, J. S., F. M. ROTTMAN, R. L. C. BRIMACOMBE, P. LEDER, M. R. BERNFIELD, and M. W. NIRENBERG. RNA Codewords and Protein Synthesis, VI. On the Nucleotide Sequences of Degenerate Codeword Sets for Isoleucine, Tyrosine, Asparagine, and Lysine, 807
———. *See* Nirenberg, M., 1161
Trypsin-catalyzed reactions (Bernhard and Gutfreund), 1238; (Barman and Gutfreund), 1243
Trypsinogen (Balls), 392
TSCHUDY, D. P., M. G. PERLROTH, H. S. MARVER, A. COLLINS, G. HUNTER, JR., and M. RECHCIGL, JR. Acute Intermittent Porphyria: The First "Overproduction Disease" Localized to a Specific Enzyme, 841
TUKEY, J. W. Which Part of the Sample Contains the Information?, 127
Tumor, ascites, hydroxyurea inhibition of DNA synthesis in (Yarbro *et al.*), 1033
Tumorigenesis, skin, inhibited by actinomycin D (Gelboin *et al.*), 1353

Tumors, malignant kidney, produced by influenza virus subcultures (Leuchtenberger *et al.*), 694
"Tumor-specific" antigen production by oncogenic viruses (Hoggan *et al.*), 12
Twisted circular form of polyoma viral DNA (Vinograd *et al.*), 1104
Tyrosyl residues of carboxypeptidase A (Roholt *et al.*), 847
Tyvelose, CDP-, enzymatic synthesis of (Elbein), 803

Ubiquinone, conversion of p-hydroxybenzoate-U-C^{14} to (Parson and Rudney), 599
UDENFRIEND, S. *See* Peterkofsky, B., 335
UDPG synthetase-defective mutants in *E. coli* (Mayer *et al.*), 459
UENO, S. *See* Bellman, R., 910
Ultrastructure in frog retinal rod (Robertson), 860
Ultraviolet-irradiated chromosomes, electron microscopy of (Bloom and Özarslan), 1294
Universe, future of, and galactic discretization (Thomas), 227
Unscrambling of data and systems identification (Bellman *et al.*), 907, 910
URBACH, W. *See* Fork, D. C., 1307
Uterine RNA studies (Mansour and Niu), 764
UV-induced triplet state in DNA (Rahn *et al.*), 893
UV-irradiated poly dI:dC, pyrimidine dimers in (Setlow *et al.*), 1111

VAGELOS, P. R. *See* Majerus, P. W., 410
Valyl- and tyrosyl-sRNA aminoacylation inhibition (Torres-Gallardo and Kern), 91
Valyl-sRNA synthetase in enzyme repression (Eidlic and Neidhardt), 539
Vascular prostheses, selection of (Sawyer *et al.*), 294
Vegetational and microclimatic contrasts, subalpine (Clausen), 1315
VINOGRAD, J., J. LEBOWITZ, R. RADLOFF, R. WATSON, and P. LAIPIS. The Twisted Circular Form of Polyoma Viral DNA, 1104
Viral RNA replication (Weissmann *et al.*), 653
Virus(es): oncogenic, and "tumor-specific" antigens (Hoggan *et al.*), 12; P8 influenza, and production of malignant kidney tumors in mice (Leuchtenberger *et al.*), 694; mouse leukemia, complement fixation for (Hartley *et al.*), 931; polyoma, DNA synthesis induced by (Weil *et al.*), 1468
VOGEL, H. J. *See* Baumberg, S., 1029
VOGT, M. *See* Dulbecco, R., 403, 890
Volatile organic material of plant origin in the atmosphere (Rasmussen and Went), 215
Volume changes in liver mitochondria (Azzone and Azzi), 1084
Volume changes of RNase with pH change (Krausz and Kauzmann), 1234
VON EHRENSTEIN, G. *See* Weisblum, B., 328
VON HIPPEL, P. H. *See* Printz, M. P., 363

WALTER, P. *See* Lardy, H. A., 1410
WANG, J. C. *See* Davidson, N., 111
WARD, P. C. J., C. EDWARDS, and E. S. BENSON. Relation between Adenosinetriphosphate Activity and Sarcomere Length in Stretched Glycerol-Extracted Frog Skeletal Muscle, 1377
WATSON, R. *See* Vinograd, J., 1104
WEBBER, B. B., and F. J. DE SERRES. Induction Kinetics and Genetic Analysis of X-Ray-Induced Mutations in the *ad-3* Region of *Neurospora crassa*, 430
WEBER, G., R. L. SINGHAL, and S. K. SRIVASTAVA. Insulin: Suppressor of Biosynthesis of Hepatic Gluconeogenic Enzymes, 96
WEIL, R., M. R. MICHEL, and G. K. RUSCHMANN. Induction of Cellular DNA Synthesis by Polyoma Virus, 1468
WEISBERGER, A. S. *See* Wolfe, S. M., 991
WEISBLUM, B., F. GONANO, G. VON EHRENSTEIN, and S. BENZER. A Demonstration of Coding Degeneracy for Leucine in the Synthesis of Protein, 328
WEISS, M. C. *See* Ephrussi, B., 1040
WEISS, S. *See* Leuchtenberger, C., 694
WEISS, S. B. *See* Hsu, W.-T., 517
WEISSMANN, C., M. A. BILLETER, M. C. SCHNEIDER, C. A. KNIGHT, and S. OCHOA. Replication of Viral RNA, VI. Nucleotide Composition of the Replicative Form of Tobacco Mosaic Virus RNA and of Its Component Strands, 653
WENT, F. W. *See* Rasmussen, R. A., 215
WESOLOWSKI, S. A. *See* Sawyer, P. N., 294
WHITAKER, J. R. *See* Bender, M. L., 711
WHITE, A. *See* Klein, J. J., 812
WHITNEY, P. L., and C. TANFORD. Recovery of Specific Activity after Complete Unfolding and Reduction of an Antibody Fragment, 524
WIDHOLM, J. *See* Davidson, N., 111
WILKINSON, R. G. *See* Naide, Y., 147
WILLIAMS, C. A., M. C. GANOZA, and F. LIPMANN. Effect of Bacterial Infection on the Synthesis of Serum Proteins by a Mouse Liver Cell-Free System, 622
———. *See* Ganoza, M. C., 619
WILLIAMS, C. M. *See* Brookes, V. J., 770
WILSON, J. R., N. ADLER, and B. LE BOEUF. The Effects of Intromission Frequency on Successful Pregnancy in the Female Rat, 1392
WOLF, F. On Accretive Boundary Problems of the Second Order, 5
WOLFE, S. M., and A. S. WEISBERGER. The Protein Synthesis by Reticulocyte Ribosomes, II. The Effects of Magnesium Ion and Chloramphenicol on Induced Protein Synthesis, 991
WOOD, R. F. *See* Kamrin, M., 1118
WOOLLEY, D. W., and B. W. GOMMI. Serotonin Receptors, VII. Activities of Various Pure Gangliosides as the Receptors, 959
Word problem (Boone), 265
WRIGHT, I. G., *See* Money, T., 901
WU, K.-T. *See* Sawyer, P. N., 294
WYCKOFF, R. W. G., and A. R. DOBERENZ. The Electron Microscopy of Rancho La Brea Bone, 230

YAMANE, T. *See* Imamoto, F., 1456

YANG, J. T. On the Phenomenological Treatments of Optical Rotatory Dispersion of Polypetides and Proteins, 438

YARBRO, J. W., B. J. KENNEDY, and C. P. BARNUM. Hydroxyurea Inhibition of DNA Synthesis in Ascites Tumor, 1033

YOSHIKAWA, H. DNA Synthesis during Germination of *Bacillus subtilis* Spores, 1476

ZELEZNICK, L. D., S. M. ROSEN, M. SALTMARSH-ANDREW, M. J. OSBORN, and B. L. HORECKER. Biosynthesis of Bacterial Lipopolysaccharide, IV. Enzymatic Incorporation of Mannose, Rhamnose, and Galactose in a Mutant Strain of *Salmonella typhimurium*, 207

ZENER, C. Redesign Overcompensation, 243

ZINDER, N. D. *See* Schwartz, J. H., 195

ZWEIG, M. *See* Snyder, S. H., 301

CONTENTS

NATIONAL ACADEMY OF SCIENCES

		Page
Symposium on the Evolution of the Earth's Atmosphere		1169
Chairman's Summary Remarks	*By P. E. Cloud, Jr.*	1169
The History of Ocean Water and Its Effect on the Chemistry of the Atmosphere	*By Heinrich D. Holland*	1173
Biochemical, Biological, and Atmospheric Evolution	*By Barry Commoner*	1183
Geochemical Aspects of Atmospheric Evolution	*By Charles F. Davidson*	1194
Fossils, Early Life, and Atmospheric History	*By Alfred G. Fischer*	1205
History of Major Atmospheric Components	*By L. V. Berkner and L. C. Marshall*	1215

MATHEMATICS

On Accretive Boundary Problems of the Second Order	*By František Wolf*	5
On the Stability of Stochastic Dynamical Systems	*By Harold J. Kushner*	8
Which Part of the Sample Contains the Information?	*By John W. Tukey*	127
On the Application of Dynamic Programing to the Determination of Optimal Play in Chess and Checkers	*By Richard Bellman*	244
On the Solutions of Linear Second-Order Differential Equations	*By A. S. Galbraith, E. J. McShane, and Gene B. Parrish*	247
On the Propagation of Energy in a Stratified Gaseous Medium	*By Steven Rosencrans*	249
Lifting Disks and Certain Light Open Mappings	*By Louis F. McAuley*	255
On the Relation between Integer and Noninteger Solutions to Linear Programs	*By R. E. Gomory*	260
Finitely Presented Group Whose Word Problem Has the Same Degree as That of an Arbitrarily Given Thue System (an Application of Methods of Britton)	*By William W. Boone*	265
Harmonic Functions with Given Values and Minimum Norms in Riemannian Spaces	*By Leo Sario and Noriko Fukuda*	270
A Tchebycheff-Like Inequality for Stochastic Processes	*By Lester E. Dubins and Leonard J. Savage*	274
A Generalization of the Lebesgue-Bochner-Stieltjes Integral and a New Approach to the Theory of Integration	*By Witold M. Bogdanowicz*	492
Results on Finite Semigroups Derived from the Algebraic Theory of Machines	*By Kenneth Krohn and John Rhodes*	499
Liapunov Functions for the Problem of Lur'e	*By K. R. Meyer*	501
A New Finite Simple Group With Abelian 2-Sylow Subgroups	*By Zvonimir Janko*	657
A Family of Spectral Operations	*By Tzee-Char Kuo*	658
A Differential Equation for the Theta Function	*By H. L. Resnikoff*	692
Intrinsic Analytic Continuation and Envelopes of Holomorphy	*By S. Bochner*	904
On the Identification of Systems and the Unscrambling of Data, I. Hidden Periodicities	*By R. E. Bellman, H. H. Kagiwada, and R. E. Kalaba*	907
On the Identification of Systems and the Unscrambling of Data, II. An Inverse Problem in Radiative Transfer	*By R. Bellman, H. Kagiwada, R. Kalaba, and S. Ueno*	910
On Continuous Martingales	*By Lester E. Dubins and Gideon Schwarz*	913
Commutators of Singular Integral Operators	*By A. P. Calderón*	1092
Existence of Periodic Solutions for Nonlinear Equations of Evolution	*By Felix E. Browder*	1100
Stability and Asymptotic Fixed-Point Theory	*By G. Stephen Jones*	1262
Cluster Sets at Isolated and Nonisolated Singularities	*By H. T. Mathews*	1264

LIMITS OF INFINITE POPULATIONS UNDER RANDOM MATING . . . . By Bob E. Ellison 1266
FIXED-POINT THEOREMS FOR NONCOMPACT MAPPINGS IN HILBERT SPACE . . . . . By Felix E. Browder 1272
A STURM-LIOUVILLE THEOREM FOR NONLINEAR ELLIPTIC PARTIAL DIFFERENTIAL EQUATIONS . . . . . By Melvyn S. Berger 1277

ASTRONOMY

SPHERICALLY SYMMETRIC DISTRIBUTIONS OF MATTER WITHOUT PRESSURE . . . . . By Guy C. Omer, Jr. 1
GALACTIC DISCRETIZATION AND THE FUTURE OF THE UNIVERSE . . By T. Y. Thomas 227

PHYSICS

ELECTRON MICROSCOPY WITH HIGH-FIELD SUPERCONDUCTING SOLENOID LENSES . . . By Humberto Fernández-Morán 445
THE ACTUAL MASS OF POTENTIAL ENERGY, A CORRECTION TO CLASSICAL RELATIVITY . By L. Brillouin 475
SOME RADIATION EFFECTS ON DNA AND ITS CONSTITUENTS . . . . . By Walter Gordy, Brenda Pruden, and Wallace Snipes 751
ELECTRON SPIN RESONANCE OF AN IRRADIATED SINGLE CRYSTAL OF THYMIDINE . . . . By Brenda Pruden, Wallace Snipes, and Walter Gordy 917
THE ACTUAL MASS OF POTENTIAL ENERGY, II . . . . . By L. Brillouin 1280
ON THE NATURE OF THE SPECTRUM OF THE TIME CORRELATION FUNCTION MATRIX FOR STOCHASTIC PROCESSES . . . . . By Frank C. Andrews 1284
ON STABILITY DEFINITIONS OF DYNAMICAL SYSTEMS . . . By Demetrios G. Magiros 1288

ENGINEERING

REDESIGN OVERCOMPENSATION . . . . . By C. Zener 242
ADVANCES IN FUSION RESEARCH . . . . . By Albert Simon 866

CHEMISTRY

MOLECULAR COMPLEXES OF FLAVINS AND PHENOLS, III. FACTORS INFLUENCING SPECTRA AND STABILITY . . . . . By Darrell E. Fleischman and Gordon Tollin 38
CHARGE TRANSFER IN MOLECULAR CRYSTALS . . . . . By H. M. McConnell, B. M. Hoffman, and R. M. Metzger 46
CONFORMATION OF AN ISOLATED POLYMER MOLECULE AT AN INTERFACE . . . . . By Ryong-Joon Roe 50
TOPOLOGICAL MAPPING OF ORGANIC MOLECULES . . . . . By Joshua Lederberg 134
STUDIES OF THE CYCLIZATIONS OF AN O-(α-METHYLALLYL)PHENOL AND THE CORRESPONDING METHYL ETHER INDUCED BY ELECTROPHILIC REAGENTS . . . . . By David P. Brust, D. Stanley Tarbell, and Sidney M. Hecht 233
MOLECULAR COMPLEXES OF FLAVINS AND PHENOLS, IV. SEMIQUINONE HYDRIODIDE COMPLEXES . . . . . By Darrell E. Fleischman and Gordon Tollin 237
ON THE PHENOMENOLOGICAL TREATMENTS OF OPTICAL ROTATORY DISPERSION OF POLYPEPTIDES AND PROTEINS . . . . . By Jen Tsi Yang 438
NUCLEAR QUADRUPOLE AND SPIN-ROTATION INTERACTION OF O^{17} IN FORMALDEHYDE . . . . . By W. H. Flygare and J. T. Lowe 576
MAGNETIC CIRCULAR DICHROISM STUDIES: A PRELIMINARY REPORT . . . . . By David A. Schooley, Edward Bunnenberg, and Carl Djerassi 579
INTERACTIONS OF METAL IONS WITH POLYNUCLEOTIDES AND RELATED COMPOUNDS, V. THE UNWINDING AND REWINDING OF DNA STRANDS UNDER THE INFLUENCE OF COPPER(II) IONS . . . . . By Gunther L. Eichhorn and Patricia Clark 586
THE EFFECT OF ENZYME ACETYLATION ON THE KINETICS OF THE CARBOXYPEPTIDASE-A-CATALYZED HYDROLYSIS OF HIPPURYL-L-β-PHENYLLACTIC ACID . . . . . By Myron L. Bender, John R. Whitaker, and Fred Menger 711

Optical Rotatory Dispersion of Chlorophyll in Solution and in Chloroplast Subunits . . . . . *By Kenneth Sauer* 716
An Experimental Method for Determining *A*-Values: The Methyl Group . . . . . *By J. F. Biellmann and William S. Johnson* 891
The UV-Induced Triplet State in DNA . . . . . *By R. O. Rahn, R. G. Shulman, and J. W. Longworth* 893
The Therapeutic Possibilities Arising from the Chemical Modification of Proteins . . . . . *By Edward M. Kosower* 897
Biosynthesis of the Indole Alkaloids . . . . . *By T. Money, I. G. Wright, F. McCapra, and A. I. Scott* 901
Nonempirical Molecular Orbital Theory from Molecular Hartree-Fock Theory . . . . . *By M. D. Newton, F. P. Boer, W. E. Palke, and W. N. Lipscomb* 1089
The Application of Significant Structure Theory to Binary Liquid Mixtures: $Ar + N_2$, $Ar + O_2$, and $O_2 + N_2$ . . . *By Bryant A. Miner and Henry Eyring* 1227
The Relationship between the Densitometric and Dilatometric Volume Changes of Ribonuclease Accompanying a Change in pH . . . . . *By Leon M. Krausz and Walter Kauzmann* 1234
The Optical Detection of Transients in Trypsin- and Chymotrypsin-Catalyzed Reactions . . . . . *By S. A. Bernhard and H. Gutfreund* 1238
The Application of the Rapid-Flow Sampling Technique to the Chemical Identification of Intermediates in Trypsin-Catalyzed Reactions . . . . . *By T. E. Barman and H. Gutfreund* 1243
Mössbauer Spectroscopy of Heme and Hemin Compounds . . . . . *By Alan J. Bearden, Thomas H. Moss, Winslow S. Caughey, and Charles A. Beaudreau* 1246

GEOLOGY

The Electron Microscopy of Rancho La Brea Bone . . . . . *By Ralph W. G. Wyckoff and Alexander R. Doberenz* 230

BOTANY

Volatile Organic Material of Plant Origin in the Atmosphere . . . . . *By Reinhold A. Rasmussen and F. W. Went* 215
The Influence of Diuron [3-(3,4-Dichlorophenyl)-1,1-Dimenthylurea] on the Respiratory and Photosynthetic Systems of Plants . . . *By H. Lundegårdh* 703
Kinetinlike Factors in the Root Exudate of Sunflowers . . . . *By H. Kende* 1302
Evidence for the Localization of Plastocyanin in the Electron-Transport Chain of Photosynthesis . . . . . *By David C. Fork and Wolfgang Urbach* 1307
Microclimatic and Vegetational Contrasts within a Subalpine Valley. . . . . *By Jens Clausen* 1315
Carrier-Mediated Cation Transport in Barley Roots: Kinetic Evidence for a Spectrum of Active Sites . . . . . *By Emanuel Epstein and D. W. Rains* 1320

ZOÖLOGY AND ANATOMY

Predation and Relative Helmet Size in Cyclomorphic Daphnia . . . . . *By John Langdon Brooks* 119
The Organization of Nuclei and Chromosomes in Honeybee Embryonic Cells . . . . . *By E. J. DuPraw* 161
Adaptive Variation in the Breeding Regime of a Tropical Sea Bird . . . . . *By N. Philip Ashmole* 311
A Suggestive Relationship of Nerve Cell RNA with Specific Synaptic Sites . . . . . *By David Bodian* 418
Staining Properties of Lanthanum on Cell Membranes . . . . . *By C. F. Doggenweiler and S. Frenk* 425
Structure of the Chromatin in Sea Urchin Sperm. . . . . *By Alberto J. Solari* 503

Salivary Gland Secretion and Its Relation to Chromosomal Puffing in the Dipteran, *Chironomus thummi* . . . . *By Hans Laufer and Yasukiyo Nakase* 511
Thymidine Kinase and Thymidylate Kinase in Relation to the Endocrine Control of Insect Diapause and Development . . . . . *By Victor J. Brookes and Carroll M. Williams* 770
On the Relation between the Productivity, Biomass, Diversity, and Stability of a Community . . . . . *By Egbert G. Leigh, Jr.* 777
The Ability of DNA and Chromatin of Developing Frog Embryos to Prime for RNA Polymerase-Dependent RNA Synthesis . . . . . *By R. A. Flickinger, S. J. Coward, M. Miyagi, C. Moser, and E. Rollins* 783
A Possible Ultrastructural Correlate of Function in the Frog Retinal Rod. . . . . *By J. David Robertson* 860
Electron Microscopy of Ultraviolet-Irradiated Parts of Chromosomes. . . . . *By William Bloom and Saime Özarslan* 1294

GENETICS

Multiple Sites of Interaction with Host-Cell DNA in the Phage λ . . . . . *By Dean B. Cowie and A. D. Hershey* 57
Pleiotropic Effects of Suppressors of a *Lac*-"Operator Negative" Mutation in *Escherichia coli* . . . . . *By T. K. Gartner and E. Orias* 62
Correlation of Genetic Activity, Heterochromatization, and RNA Metabolism . . . . . *By Laurence Berlowitz* 68
Cytoplasmic Inheritance of the Organization of the Cell Cortex in *Paramecium aurelia* . . . . . *By Janine Beisson and T. M. Sonneborn* 275
Genetic Damage Induced by Ethylenimine . *By Mary L. Alexander and Evalea Glanges* 282
Induction Kinetics and Genetics Analysis of X-Ray-Induced Mutations in the *ad-3* Region of *Neurospora crassa* . . . . *By B. B. Webber and F. J. de Serres* 430
Isolation and Characterization of Recombination-Deficient Mutants of *Escherichia coli* K12 . . . . . *By Alvin J. Clark and Ann Dee Margulies* 451
Bichromosomal Synthetic Semilethals in *Drosophila pseudoobscura* . . . . . *By Theodosius Dobzhansky, Boris Spassky, and Wyatt Anderson* 482
The Presence of Subunits in the Inherited Group-Specific Protein of Human Serum . . . . . *By Barbara H. Bowman and Alexander G. Bearn* 722
The Karyotype of the Mouse, with Identification of a Translocation . . . . . *By Dorothea Bennett* 730
Localization of DNA Complementary to Ribosomal RNA in the Nucleolus Organizer Region of *Drosophila melanogaster* . *By F. M. Ritossa and S. Spiegelman* 737
Subunit Dissociation and Recombination of Catalase Isozymes . . . . . *By John G. Scandalios* 1035
Interspecific Hybridization of Somatic Cells . . . . . *By Boris Ephrussi and Mary C. Weiss* 1040
Genetic Load in Tribolium . . . . . *By Howard Levene, I. Michael Lerner, Alexander Sokoloff, Frank K. Ho, and Ian R. Franklin* 1042
The Genetics of a Common Indian Digital Abnormality . . . . . *By Ajit Kisor Ray and J. B. S. Haldane* 1050
Recombination of Nonchromosomal Genes in *Chlamydomonas* . . . . . *By Ruth Sager and Zenta Ramanis* 1053
Primary and Secondary Mutations at the Incompatibility Loci in *Schizophyllum* . . . . . *By John R. Raper, Dana H. Boyd, and Carlene A. Raper* 1324
Orientation of the Histidine Operon in the *Salmonella typhimurium* Linkage Map. . . . . *By Philip E. Hartman, Charlotte Rusgis, and Ruth C. Stahl* 1332
Information Transfer in *Salmonella typhimurium* . . . *By Kenneth E. Sanderson* 1335
Evidence Bearing on the Coincidence of Exchange and DNA Replication in the Oocyte of *Drosophila melanogaster* . . . *By Rhoda F. Grell and Ann C. Chandley* 1340

PHYSIOLOGY

ISOLATION OF A SOLUBLE TRANSPLANTATION ANTIGEN . . . . . *By Barry D. Kahan* 153
ELECTROCHEMICAL PRECIPITATION OF BLOOD CELLS ON METAL ELECTRODES: AN AID IN THE SELECTION OF VASCULAR PROSTHESES? . . . . . *By P. N. Sawyer, Kwang-Tzen Wu, S. A. Wesolowski, W. H. Brattain, and P. J. Boddy* 294
CONTROL OF THE CIRCADIAN RHYTHM IN SEROTONIN CONTENT OF THE RAT PINEAL GLAND . . . . . *By Solomon H. Snyder, Mark Zweig, Julius Axelrod, and Josef E. Fischer* 301
MEMBRANE POTENTIALS, RESISTANCE, AND ION PERMEABILITY IN SQUID GIANT AXONS INJECTED OR PERFUSED WITH PROTEASES . . . . . *By Eduardo Rojas* 306
THE ELECTROCHEMICAL PRECIPITATION OF FIBRINOGEN . . . . . *By J. C. Ogoniak and P. N. Sawyer* 572
PRODUCTION OF ACTION POTENTIALS BY THE INTERNODES OF ISOLATED MYELINATED NERVE FIBERS . . . . . *By R. Lorente de Nó and V. Honrubia* 757
FUNCTIONAL STUDIES WITH UTERINE RNA . . *By A. Maher Mansour and M. C. Niu* 764
THEORY OF THE FLOW OF ACTION CURRENTS IN ISOLATED MYELINATED NERVE FIBERS, I . . . . . *By R. Lorente de Nó and V. Honrubia* 938
A DIFFERENTIATION IN RNA RESPONSE IN NEURONS EARLY AND LATE DURING LEARNING . . . . . *By H. Hydén and P. W. Lange* 946
THE ACTION OF ANESTHETICS ON EXCITABLE MEMBRANES: A QUANTUM-CHEMICAL ANALYSIS . . . . . *By D. Agin, L. Hersh, and D. Holtzman* 952
TRANSCHOLESTERIN, A CHOLESTEROL-BINDING GLOBULIN: SEROLOGICAL DEMONSTRATION OF A SPECIFIC INTERACTION BETWEEN CHOLESTEROL AND SERUM GLOBULIN . . . . . *By Thomas Francis, Jr., Nan-Sing Ling, and Todor Krasteff* 1061
PHARMACOLOGICAL SUPPORT FOR MAN ON LONG SPACE FLIGHTS . . *By Carl F. Schmidt* 1365
AUTORADIOGRAPHIC LOCALIZATION OF THE ACETYLCHOLINE-STIMULATED SYNTHESIS OF PHOSPHATIDYLINOSITOL IN THE SUPERIOR CERVICAL GANGLION . *By Lowell E. Hokin* 1369
RELATION BETWEEN ADENOSINETRIPHOSPHATE ACTIVITY AND SARCOMERE LENGTH IN STRETCHED GLYCEROL-EXTRACTED FROG SKELETAL MUSCLE . . . . . *By Patrick C. J. Ward, Charles Edwards, and E. S. Benson* 1377
THEORY OF THE FLOW OF ACTION CURRENTS IN ISOLATED MYELINATED NERVE FIBERS, II . . . . . *By R. Lorente de Nó and V. Honrubia* 1384

PATHOLOGY AND MICROBIOLOGY

PRODUCTION OF "TUMOR-SPECIFIC" ANTIGENS BY ONCOGENIC VIRUSES DURING ACUTE CYTOLYTIC INFECTIONS . . . . . *By M. David Hoggan, Wallace P. Rowe, Paul H. Black, and Robert J. Huebner* 21
PHAGOCYTOSIS OF THE ANTIGEN, A CRUCIAL STEP IN THE INDUCTION OF THE PRIMARY RESPONSE . . . . . *By P. C. Frei, B. Benacerraf, and G. J. Thorbecke* 20
ACRIFLAVINE RESISTANCE: A BACTERIOPHAGE MUTATION AFFECTING THE UPTAKE OF DYE BY THE INFECTED BACTERIAL CELLS . . . . . *By Simon Silver* 24
GASEOUS HYDROCARBONS AND THE GERMINATION OF BACTERIAL SPORES . . . . . *By L. J. Rode and J. W. Foster* 31
ENHANCEMENT OF NATURAL HEMOLYSIN IN ADULT RABBITS AFTER RADIATION . . . . . *By William H. Taliaferro and Lucy Graves Taliaferro* 139
SEMIROUGH STRAINS OF *Salmonella* . . . . . *By Yorio Naide, Hiroshi Nikaido, P. Helena Mäkelä, R. G. Wilkinson, and B. A. D. Stocker* 147
EFFECT OF ACTINOMYCIN D ON VIRUS AND ENDOTOXIN-INDUCED INTERFERONLIKE INHIBITORS IN RABBITS . . . . . *By Monto Ho and Yuji Kono* 220
CLONAL GROWTH OF MAMMALIAN CELLS IN A CHEMICALLY DEFINED, SYNTHETIC MEDIUM . . . . . *By Richard G. Ham* 288
CELL-TRANSFORMING ABILITY OF A TEMPERATURE-SENSITIVE MUTANT OF POLYOMA VIRUS . . . . . *By Michael Fried* 489
THE NATURE AND LOCALIZATION OF THE SV40-INDUCED COMPLEMENT-FIXING ANTIGEN . . . . . *By R. V. Gilden, R. I. Carp, F. Taguchi, and V. Defendi* 684

TRANSFORMATION INDUCED BY PR 8 INFLUENZA VIRUS IN PRIMARY CULTURES OF MOUSE KIDNEY AND BRONCHUS, AND PRODUCTION OF MALIGNANT KIDNEY TUMORS IN MICE BY SUBCULTURES . . . . . *By Cecilie Leuchtenberger, Rudolf Leuchtenberger, Theodor Brunner, Dorothy Norlin, and Sylvia Weiss* 694

A NONSPECIFIC INCREASE IN PERMEABILITY IN *Escherichia coli* PRODUCED BY EDTA . . . . . *By Loretta Leive* 745

SEQUENTIAL TEMPORAL REPLICATION OF DNA IN *Physarum polycephalum* . . . . . *By Richard Braun, C. Mittermayer, and Harold P. Rusch* 924

COMPLEMENT FIXATION AND TISSUE CULTURE ASSAYS FOR MOUSE LEUKEMIA VIRUSES . *By Janet W. Hartley, Wallace P. Rowe, Worth I. Capps, and Robert J. Huebner* 931

STUDIES ON MICROBIAL RNA, III. FORMATION OF SUBMETHYLATED sRNA IN *Saccharomyces cerevisiae* . . . . . *By Kerstin Kjellin-Strâby and Hans G. Boman* 1346

INHIBITION OF MOUSE SKIN TUMORIGENESIS BY ACTINOMYCIN D . . . . . *By Harry V. Gelboin, Michael Klein, and Richard R. Bates* 1353

SYNTHESIS OF COLLAGEN BY MAMMALIAN CELL LINES OF FIBROBLASTIC AND NONFIBROBLASTIC ORIGIN . . . . . *By Howard Green and Burton Goldberg* 1360

PSYCHOLOGY

THE EFFECTS OF INTROMISSION FREQUENCY ON SUCCESSFUL PREGNANCY IN THE FEMALE RAT . . . . . *By James R. Wilson, Norman Adler, and Burney Le Boeuf* 1392

GEOPHYSICS

ASYMPTOTIC THEORY OF THE FREE TORSIONAL OSCILLATIONS OF THE EARTH . . . . . *By C. L. Pekeris* 1254

BIOCHEMISTRY

COMPARTMENTATION OF THE MITOCHONDRION . *By Gerald Brierley and David E. Green* 73

SYNTHETIC DEOXYRIBO-OLIGONUCLEOTIDES AS TEMPLATES FOR THE DNA POLYMERASE OF *Escherichia coli:* NEW DNA-LIKE POLYMERS CONTAINING REPEATING NUCLEOTIDE SEQUENCES . . . . . *By C. Byrd, E. Ohtsuka, M. W. Moon, and H. G. Khorana* 79

In vitro SYNTHESIS OF PARTICULATE GLYCOGEN . . . . . *By José Mordoh, Luis F. Leloir, and Clara R. Krisman* 86

THE SPECIFIC INHIBITION OF THE ENZYMATIC AMINOACYLATION OF VALYL- AND TYROSYL-sRNA BY PERIODATE-OXIDIZED sRNA . *By Jesus Torres-Gallardo and Milton Kern* 91

INSULIN: SUPPRESSOR OF BIOSYNTHESIS OF HEPATIC GLUCONEOGENIC ENZYMES . . . . . *By George Weber, R. L. Singhal, and S. K. Srivastava* 96

FORMATION AND CONVERSION OF MACROMOLECULAR PRECURSOR(S) IN THE BIOSYNTHESIS OF CARBAMYL PHOSPHATE SYNTHETASE . *By Masamiti Tatibana and Philip P. Cohen* 104

PREPARATION AND PROPERTIES OF NATIVE CRAB dAT . . . . . *By N. Davidson, J. Widholm, U. S. Nandi, R. Jensen, B. M. Olivera, and J. C. Wang* 111

OPTICAL ROTATORY DISPERSION OF HUMAN CARBONIC ANHYDRASES: COTTON EFFECTS AND AROMATIC ABSORPTION BANDS . . . . *By Dirck V. Myers and John T. Edsall* 169

DISSOCIATION OF AMINO ACID ACCEPTOR FUNCTIONS OF sRNA FROM ITS TRANSFER FUNCTION . . . . . *By S. Nishimura and G. David Novelli* 178

STUDIES ON THE ENZYMIC SYNTHESIS OF THYMIDINE-3′-TRIPHOSPHATE . . . . . *By E. S. Canellakis, H. O. Kammen, and D. R. Morales* 184

ON THE MOLECULAR MECHANISM OF BIOLUMINESCENCE, II. LIGHT-INDUCED LUMINESCENCE . . . . *By Q. H. Gibson, J. W. Hastings, and C. Greenwood* 187

BIOSYNTHESIS OF THE COAT PROTEIN OF COLIPHAGE f2 BY EXTRACTS OF *Euglena gracilis* . . . . . *By J. H. Schwartz, J. M. Eisenstadt, G. Brawerman, and N. D. Zinder* 195

IRREVERSIBILE ELECTROCHEMICAL PRECIPITATION OF MAMMALIAN PLATELETS AND INTRAVASCULAR THROMBOSIS . . . . . *By Philip N. Sawyer, James H. Reardon, and Jeanette C. Ogoniak* 200

BIOSYNTHESIS OF BACTERIAL LIPOPOLYSACCHARIDE, IV. ENZYMATIC INCORPORATION OF MANNOSE, RHAMNOSE, AND GALACTOSE IN A MUTANT STRAIN OF *Salmonella typhimurium* . . . . . *By L. D. Zeleznick, S. M. Rosen, M. Saltmarsh-Andrew, M. J. Osborn, and B. L. Horecker* 207
ASSEMBLY OF MEMBRANE SUBUNITS . . . . . *By David E. Green and Oscar Hechter* 318
COMPLEMENTARY STRUCTURE OF INTERACTING SITES AT THE ENDS OF LAMBDA DNA MOLECULES . . . . . *By A. D. Hershey and Elizabeth Burgi* 325
A DEMONSTRATION OF CODING DEGENERACY FOR LEUCINE IN THE SYNTHESIS OF PROTEIN . . *By Bernard Weisblum, Fabio Gonano, Gunter von Ehrenstein, and Seymour Benzer* 328
ENZYMATIC HYDROXYLATION OF PROLINE IN MICROSOMAL POLYPEPTIDE LEADING TO FORMATION OF COLLAGEN . . . . *By Beverly Peterkofsky and Sidney Udenfriend* 335
DETERMINATION OF STOICHIOMETRY AND EQUILIBRIUM CONSTANTS FOR REVERSIBLY ASSOCIATING SYSTEMS BY MOLECULAR SIEVE CHROMATOGRAPHY . . . . . *By G. K. Ackers and T. E. Thompson* 342
CONTACT INHIBITION, MACROMOLECULAR SYNTHESIS, AND POLYRIBOSOMES IN CULTURED HUMAN DIPLOID FIBROBLASTS . . . . . *By Elliot M. Levine, Yechiel Becker, Charles W. Boone, and Harry Eagle* 350
MOLECULAR SIZE AND CIRCULARITY OF DNA IN CELLS OF MAMMALS AND HIGHER PLANTS . . . . . *By Yasuo Hotta and Alix Bassel* 356
HYDROGEN EXCHANGE STUDIES OF DNA STRUCTURE . . . . . *By Morton P. Printz and Peter H. von Hippel* 363
HYDROGEN EXCHANGE STUDIES OF sRNA . . *By S. W. Englander and J. J. Englander* 370
CONTROL OF VIRAL MESSENGER RNA AFTER LAMBDA PHAGE INFECTION AND INDUCTION . . . . . *By W. S. Sly, H. Echols, and J. Adler* 378
CODING AND CHARGING SPECIFICITIES OF sRNA'S ISOLATED BY COUNTERCURRENT DISTRIBUTION . . . *By Thomas Peter Bennett, Jack Goldstein, and Fritz Lipmann* 385
CONCERNING TRYPSINOGEN . . . . . *By A. K. Balls* 392
CARBOXYPEPTIDASE A, II. THE THREE-DIMENSIONAL ELECTRON DENSITY MAP AT 6 Å RESOLUTION . . . . . *By J. A. Hartsuck, M. L. Ludwig, H. Muirhead, T. A. Steitz, and W. N. Lipscomb* 396
INDUCTION OF CELLULAR DNA SYNTHESIS BY POLYOMA VIRUS . . . . . *By R. Dulbecco, L. H. Hartwell, and M. Vogt* 403
ACYL CARRIER PROTEIN, IV. THE IDENTIFICATION OF 4′-PHOSPHOPANTETHEINE AS THE PROSTHETIC GROUP OF THE ACYL CARRIER PROTEIN . . . . . *By Philip W. Majerus, Alfred W. Alberts, and P. Roy Vagelos* 410
THE SELECTIVITY OF BIOSYNTHESIS OF GLUCOSYL COMPOUNDS AS ILLUSTRATED BY AN *E. coli* MUTANT DEFECTIVE IN UDPG SYNTHETASE . . . . . *By Hubert Mayer, Annette M. C. Rapin, and Herman M. Kalckar* 459
REACTIONS OF COENZYME Q IN THE DPNH DEHYDROGENASE SEGMENT OF THE RESPIRATORY CHAIN . . . . . *By J. M. Machinist and Thomas P. Singer* 467
THE INFLUENCE OF POLYCYCLIC AROMATIC HYDROCARBONS ON BACTERIOPHAGE DEVELOPMENT . . . . . *By Wen-Tah Hsu, John W. Moohr, and Samuel B. Weiss* 517
RECOVERY OF SPECIFIC ACTIVITY AFTER COMPLETE UNFOLDING AND REDUCTION OF AN ANTIBODY FRAGMENT . . . . . *By Philip L. Whitney and Charles Tanford* 524
NITROGEN FIXATION: HYDROSULFITE AS ELECTRON DONOR WITH CELL-FREE PREPARATIONS OF *Azotobacter vinelandii* AND *Rhodospirillum rubrum* . . . . . *By W. A. Bulen, R. C. Burns, and J. R. LeComte* 532
ROLE OF VALYL-sRNA SYNTHETASE IN ENZYME REPRESSION . . . . . *By Lia Eidlic and Frederick C. Neidhardt* 539
SPECIFIC CLEAVAGE OF THE YEAST ALANINE RNA INTO TWO LARGE FRAGMENTS . . . . . *By John Robert Penswick and Robert W. Holley* 543
ISOLATION OF LARGE OLIGONUCLEOTIDE FRAGMENTS FROM THE ALANINE RNA . . . . . *By Jean Apgar, George A. Everett, and Robert W. Holley* 546
THE CHARACTERIZATION OF A NEW SPECIES OF LEUCYL-sRNA FORMED DURING METHIONINE DEPRIVATION OF *Escherichia coli* WITH RELAXED CONTROL . . . . . *By Robert A. Lazzarini and Alan Peterkofsky* 549

SODIUM-POTASSIUM-ACTIVATED ATPASE AND POTASSIUM-ACTIVATED *p*-NITROPHENYLPHOSPHATASE: A COMPARISON OF THEIR SUBCELLULAR LOCALIZATION IN RAT BRAIN . . . . *By R. W. Albers, Georgina Rodriguez de Lores Arnaiz, and E. De Robertis* 557
BASE SEQUENCE DETERMINATION IN NUCLEIC ACIDS WITH THE ELECTRON MICROSCOPE, III. CHEMISTRY AND MICROSCOPY OF GUANINE-LABELED DNA . . . . . *By Evangelos N. Moudrianakis and Michael Beer* 564
INHIBITION OF PROTEIN SYNTHESIS BY CHLORTETRACYCLINE IN THE *E. coli in vitro* SYSTEM . . . . . *By Marian Hierowski* 594
AN INTERMEDIATE IN THE CONVERSION OF P-HYDROXYBENZOATE-U-C^{14} TO UBIQUINONE IN *Rhodospirillum rubrum* . . . . . *By William W. Parson and Harry Rudney* 599
STUDIES ON THE FORMATION OF TOBACCO MOSAIC VIRUS RIBONUCLEIC ACID, VI. MODE OF DEGRADATION OF HOST RIBONUCLEIC ACID TO RIBONUCLEOSIDES AND THEIR CONVERSION TO RIBONUCLEOSIDE 5′-PHOSPHATES . *By K. K. Reddi and LJ. Mauser* 607
ACTINOMYCIN D INHIBITION OF MICROSOMAL-BOUND HYDROXYPROLINE FORMATION IN RABBIT EMBRYO SKIN *in vitro*. . . . *By Isaac J. Bekhor and Lucien A. Bavetta* 613
SYNTHESIS OF SERUM PROTEINS BY A CELL-FREE SYSTEM FROM RAT LIVER . . . . . *By M. Clelia Ganoza, Curtis A. Williams, and Fritz Lipmann* 619
EFFECT OF BACTERIAL INFECTION ON THE SYNTHESIS OF SERUM PROTEINS BY A MOUSE LIVER CELL-FREE SYSTEM. . . . . *By Curtis A. Williams, M. Clelia Ganoza, and Fritz Lipmann* 622
REGULATION OF RNA SYNTHESIS IN ISOLATED NUCLEOLI BY HISTONES AND NUCLEOLAR PROTEINS . . . *By Ming C. Liau, Lubomir S. Hnilica, and Robert B. Hurlbert* 626
TRANSIENT FREE RADICAL FORMS OF HORMONES: EPR SPECTRA FROM CATECHOLAMINES AND ADRENOCHROME . . . . . *By Donald C. Borg* 633
RNA CODEWORDS AND PROTEIN SYNTHESIS, V. EFFECT OF STREPTOMYCIN ON THE FORMATION OF RIBOSOME-sRNA COMPLEXES . . . . . *By Sidney Pestka, Richard Marshall, and Marshall Nirenberg* 639
A METHOD POTENTIALLY USEFUL FOR ESTABLISHING BASE SEQUENCES IN CODEWORDS . . . . . *By Semih Erhan, Lulla G. Northrup, and Franklin R. Leach* 646
REPLICATION OF VIRAL RNA, VI. NUCLEOTIDE COMPOSITION OF THE REPLICATIVE FORM OF TOBACCO VIRUS RNA AND OF ITS COMPONENT STRANDS . . . . *By Charles Weissmann, Martin A. Billeter, Morton C. Schneider, C. A. Knight, and Severo Ochoa* 653
SYNTHESIS OF HYDROXYPROLINE *in vitro* BY THE HYDROXYLATION OF PROLINE IN A PRECURSOR OF COLLAGEN . . . . . *By Darwin J. Prockop and Kale Juva* 661
THE DIRECTION OF READING MESSENGER RNA DURING PROTEIN SYNTHESIS . . . . . *By Eric F. Eikenberry and Alexander Rich* 668
DISULFIDE INTERCHANGE AND THE THREE-DIMENSIONAL STRUCTURE OF PROTEINS. . . . . *By David Givol, Francesco De Lorenzo, Robert F. Goldberger, and Christian B. Anfinsen* 676
AROMATIC AZO DERIVATIVES PREVENTING MAMMARY CANCER AND ADRENAL INJURY FROM 7,12-DIMENTHYLBENZ(A)-ANTHRACENE . . . *By Charles Huggins and John Pataki* 791
THE ORDER OF INDUCTION AND DEINDUCTION OF THE ENZYMES OF THE LACTOSE OPERON IN *E. coli* . . . . . *By David H. Alpers and Gordon M. Tomkins* 797
THE ENZYMATIC SYNTHESIS OF CYTIDINE DIPHOSPHATE TYVELOSE . *By Alan D. Elbein* 803
RNA CODEWORDS AND PROTEIN SYNTHESIS, VI. ON THE NUCLEOTIDE SEQUENCES OF DEGENERATE CODEWORD SETS FOR ISOLEUCINE, TYROSINE, ASPARAGINE, AND LYSINE . . . . . *By Joel S. Trupin, Fritz M. Rottman, Richard L. C. Brimacombe, Philip Leder, Merton R. Bernfield, and Marshall W. Nirenberg* 807
ENHANCEMENT OF *in vivo* INCORPORATION OF LABELED PRECURSORS INTO DNA AND TOTAL PROTEIN OF MOUSE LYMPH NODES AFTER ADMINISTRATION OF THYMIC EXTRACTS . . . . . *By Jerome J. Klein, Allan L. Goldstein, and Abraham White* 812
THE ISOLATION AND CHARACTERIZATION OF THYROCALCITONIN . . . . . *By Alan Tenenhouse, Claude Arnaud, and Howard Rasmussen* 818
CRYSTALLINE BACTERIAL LUCIFERASE FROM *Photobacterium fischeri* . . . . . *By Seishi Kuwabara, Milton J. Cormier, Leon S. Dure, Paul Kreiss, and Peter Pfuderer* 822
TRANSIENT FREE RADICAL FORMS OF HORMONES: EPR SPECTRA FROM IODOTHYRONINES, INDOLES, ESTROGENS, AND INSULIN . . . . . *By Donald C. Borg* 829
D-MANNOSE AS A CONSTITUENT OF THE DNA OF A MUTANT STRAIN OF A BACTERIOPHAGE SP8 . . . . . *By Eugene Rosenberg* 836

ACUTE INTERMITTENT PORPHYRIA: THE FIRST "OVERPRODUCTION DISEASE" LOCALIZED TO A SPECIFIC ENZYME . . . . . *By Donald P. Tschudy, Mark G. Perlroth, Harvey S. Marver, Annie Collins, George Hunter, Jr., and M. Rechcigl, Jr.* 841

PEPTIDES CONTAINING THE FUNCTIONAL TYROSYL RESIDUES OF THE ACTIVE CENTER OF BOVINE PANCREATIC CARBOXYPEPTIDASE A . . . . . *By Oliver A. Roholt, Gerald Radzimski, and David Pressman* 847

BIOSYNTHESIS OF THE TWO CHAINS OF INSULIN . . . . . *By René E. Humbel* 853

INABILITY OF THYMINE-DEPENDENT MUTANTS OF BACTERIOPHAGE T4 TO INDUCE THYMIDYLATE SYNTHETASE . . *By David M. Shapiro, Joseph Eigner, and G. Robert Greenberg* 874

LIPID-PHOSPHOACETYLMURAMYL-PENTAPEPTIDE AND LIPID-PHOSPHODISACCHARIDE-PENTAPEPTIDE: PRESUMED MEMBRANE TRANSPORT INTERMEDIATES IN CELL WALL SYNTHESIS . . . . . *By John S. Anderson, Michio Matsuhashi, Mary A. Haskin, and Jack L. Strominger* 881

SEROTONIN RECEPTORS, VII. ACTIVITIES OF VARIOUS PURE GANGLIOSIDES AS THE RECEPTORS . . . . . *By D. W. Woolley and B. W. Gommi* 959

In vitro SYNTHESIS OF BRAIN PROTEIN . . . *By Albert L. Rubin and Kurt H. Stenzel* 963

DNA TRANSFER FROM PHAGE T5 TO HOST CELLS: DEPENDENCE ON INTERCURRENT PROTEIN SYNTHESIS . . . . . *By Yvonne Théry Lanni* 969

A CONJECTURE ON CONFORMATIONS LEADING TO ENERGY TRAPPING IN HELICAL POLYMERS . . . . . *By Ian H. Hillier and Stuart A. Rice* 973

A REVERSIBLE OXIDATIVE INACTIVATION OF SPECIFIC TRANSFER RNA SPECIES . . . . . *By John A. Carbon, Lena Hung, and Diane S. Jones* 979

A MUTANT STRAIN OF *Chlamydomonas reinhardi* LACKING RIBULOSE DIPHOSPHATE CARBOXYLASE ACTIVITY . . . . . *By R. P. Levine and Robert K. Togasaki* 987

PROTEIN SYNTHESIS BY RETICULOCYTE RIBOSOMES, II. THE EFFECTS OF MAGNESIUM ION AND CHLORAMPHENICOL ON INDUCED PROTEIN SYNTHESIS . . . . . *By Sidney M. Wolfe and Austin S. Weisberger* 991

SIDE-CHAIN OPTICAL ACTIVITY IN CYSTINE-CONTAINING PROTEINS: CIRCULAR DICHROISM STUDIES . . . . . *By Sherman Beychok* 999

FACTORS AFFECTING THE REVERSIBLE DISSOCIATION OF DEHYDROGENASES . . . . . *By Oscar P. Chilson, G. Barrie Kitto, and Nathan O. Kaplan* 1006

AMINO ACID INCORPORATION INTO PROTEOLIPID OF MYELIN *in vitro* . . . . . *By Claude B. Klee and Louis Sokoloff* 1014

THE BINDING OF AMINOACYL-sRNA'S TO RIBOSOMES STIMULATED BY BLOCK OLIGONUCLEOTIDES . . . . . *By Robert E. Thach and T. A. Sundararajan* 1021

INDIVIDUALLY REPRESSIBLE ENZYMES SPECIFIED BY CLUSTERED GENES OF ARGININE SYNTHESIS . . . . . *By S. Baumberg, D. F. Bacon, and H. J. Vogel* 1029

HYDROXYUREA INHIBITION OF DNA SYNTHESIS IN ASCITES TUMOR . . . . . *By J. W. Yarbro, B. J. Kennedy, and C. P. Barnum* 1033

A MECHANISM FOR THE REACTIONS OF CALCIUM WITH MITOCHONDRIA . . . . . *By Howard Rasmussen, Britton Chance, and Etsuro Ogata* 1069

INDUCED ACTIVE TRANSPORT OF IONS IN MITOCHONDRIA . . . *By Berton C. Pressman* 1076

VOLUME CHANGES IN LIVER MITOCHONDRIA . *By Giovanni Felice Azzone and Angelo Azzi* 1084

THE TWISTED CIRCULAR FORM OF POLYOMA VIRAL DNA . . . . . *By J. Vinograd, J. Lebowitz, R. Radloff, R. Watson, and P. Laipis* 1104

PYRIMIDINE DIMERS IN UV-IRRADIATED POLY dI:dC . . . . . *By R. B. Setlow, W. L. Carrier, and F. J. Bollum* 1111

ANILIDES AND PHENYLUREAS: CORRELATION BETWEEN CALCULATED Pi-ELECTRON STRUCTURE AND INHIBITION OF PHOTOSYNTHESIS . . . . . *By Michael Kamrin, Walter F. Bertsch, and R. F. Wood* 1118

ISOLATION OF DEOXYRIBONUCLEIC ACID FROM MITOCHONDRIA OF CHICK EMBRYO HEART AND LIVER . . . . . *By Murray Rabinowitz, John Sinclair, Louis DeSalle, Robert Haselkorn, and Hewson H. Swift* 1126

AN EFFECT OF STREPTOMYCIN ON THE BIOSYNTHESIS OF THE COAT PROTEIN OF COLIPHAGE f2 BY EXTRACTS OF *E. coli* . . . . . *By James H. Schwartz* 1133

ASYMMETRIC RNA SYNTHESIS *in vitro:* HETEROLOGOUS DNA-ENZYME SYSTEMS; *E. coli* RNA POLYMERASE . . . . . *By Anthony J. E. Colvill, Lee C. Kanner, Glauco P. Tocchini-Valentini, Marlene T. Sarnat, and E. Peter Geiduschek* 1140

On the Mechanism of Acetylation of Fetal and Chicken Hemoglobins . . . . . *By Guy Marchis-Mouren and Fritz Lipmann* 1147
Cross-Linking and Repair of DNA in Sensitive and Resistant Strains of *E. coli* Treated with Nitrogen Mustard . . . . . *By Kurt W. Kohn, Neal H. Steigbigel, and Carlos L. Spears* 1154
RNA Codewords and Protein Synthesis, VII. On the General Nature of the RNA Code . . . . . *By M. Nirenberg, P. Leder, M. Bernfield, R. Brimacombe, J. Trupin, F. Rottmann, and C. O'Neal* 1161
The Mechanism of Action of Aldolases, XI. Activation by Aromatic Sulfhydryl Reagents and β-Elimination of Selected Thiol Groups . . . . . *By T. Cremona, J. Koval, and B. L. Horecker* 1395
Amino Acid Sequence Studies with Bence-Jones Proteins . . . . . *By Norbert Hilschmann and Lyman C. Craig* 1403
Paths of Carbon in Gluconeogenesis and Lipogenesis: The Role of Mitochondria in Supplying Precursors of Phosphoenolpyruvate . . . . . *By Henry A. Lardy, Verner Paetkau, and Paul Walter* 1410
Surface Features of the 50S Ribosomal Component of *Escherichia coli* . . . . . *By Roger G. Hart* 1415
Photoreduction of Ferredoxin and Its Use in Carbon Dioxide Fixation by a SubCellular System from a Photosynthetic Bacterium . . . . . *By M. C. W. Evans and Bob B. Buchanan* 1420
Polynucleotides, VI. Interaction between Polyguanylic Acid and Polycytidylic Acid . . . . . *By François Pochon and A. M. Michelson* 1425
The Chemical Nature of Photoreactivable Lesions in DNA . . . . . *By Jane K. Setlow, M. E. Boling, and F. J. Bollum* 1430
Polyribosome Dissociation and Formation in Intact Reticulocytes with Conservation of Messenger Ribonucleic Acid . . . . . *By Paul A. Marks, Edward R. Burka, Francesco M. Conconi, William Perl, and Richard A. Rifkind* 1437
Studies on the Role of Protein Synthesis in the Regulation of Corticosterone Production by Adrenocorticotropic Hormone *in vivo* . . . . . *By Leonard D. Garren, Robert L. Ney, and Warren W. Davis* 1443
Replication of Double-Strand Nucleic Acids . . . . . *By Herbert Jehle* 1451
Existence of Two Phenylalanyl-sRNA Synthetases in *Neurospora crassa* . . . . . *By Fumio Imamoto, Tetsuo Yamane, and Noboru Sueoka* 1456
Interspecies Aminoacyl-sRNA Formation: Fractionation of Neurospora Enzymes Involved in Anomalous Aminoacylation . . . . . *By W. Edgar Barnett* 1462
Induction of Cellular DNA Synthesis by Polyoma Virus . . . . . *By Roger Weil, Marcel R. Michel, and Gisela K. Ruschmann* 1468
DNA Synthesis during Germination of *Bacillus subtilis* Spores . . . . . *By Hiroshi Yoshikawa* 1476
Regulation of Pyrimidine Biosynthesis in *Serratia marcescens* . . . . . *By William S. Hayward and William L. Belser* 1483
Recognition of Ribosomal RNA Sites in DNA, I. Analysis of the *E. coli* System . . . . . *By Guiseppe Attardi, Pien Chien Huang, and Susan Kabat* 1490

ERRATA

The Ionic Centrifuge and Fusion Nuclear Power . . . . . *By Joseph Slepian* 225
A Two-Quantasome Theory of Chlorophyll-a Fluorescence in Green Plant Photosynthesis . . . . . *By Robert M. Pearlstein* 702
Induction of Cellular DNA Synthesis by Polyoma Virus . . . . . *By R. Dulbecco, L. H. Hartwell, and M. Vogt* 890
Transient Free Radical Forms of Hormones: EPR Spectra from Catecholamines and Adrenochrome . . . . . *By D. C. Borg* 890
On the Stability of Stochastic Dynamical Systems . . . . *By Harold J. Kushner* 1498

Proceedings of the
National Academy of Sciences
of the United States of America

VOLUME 54, 1965

EDITORIAL BOARD OF THE PROCEEDINGS

SAUNDERS MAC LANE, *Chairman and Editor*
JOHN T. EDSALL, *Vice Chairman and Associate Editor*
HUGH L. DRYDEN, *Home Secretary* HARRISON S. BROWN, *Foreign Secretary*
L. V. BERKNER, *Treasurer*

MANSON BENEDICT
S. CHANDRASEKHAR
CARL DJERASSI
KATHERINE ESAU
THOMAS FRANCIS, JR.
HERBERT FRIEDMAN
R. W. GERARD
ARTHUR KORNBERG
GORDON J. F. MACDONALD
H. L. SHAPIRO
D. C. SPENCER
FRANCIS J. TURNER

Editorial Associate: JOSEPHINE A. WILLIAMS

★

PUBLISHED MONTHLY BY
THE NATIONAL ACADEMY OF SCIENCES

I N D E X

AANNING, H. L. *See* Yamashiro, D., 166
ABELL, C. W., L. A. ROSINI, and M. R. RAMSEUR. Alkylation of Polyribonucleotides: The Biological, Physical, and Chemical Properties of Alkylated Polyuridylic Acid, 608
ABELSON, P. H. Abiogenic Synthesis in the Martian Environment, 1490
Abiogenic synthesis in Martian environment (Abelson), 1490
Acetone inactivation of oxytocin (Yamashiro *et al.*), 166
Acidic proteins of cell nucleus in protein synthesis (Wang), 800
Actinomycin D: as DNA synthesis inhibitor (Baserga *et al.*), 745, 1141; and synthesis of viral RNA (Loh and Soergel), 857
Action currents in nerve fibers (Lorente de Nó and Honrubia), 82, 388, 770, 1061, 1303, 1606, 1803
Acyl carrier protein (Larrabee *et al.*), 267
Acyl phosphate in "transport ATPase" (Hokin *et al.*), 177
Acylcarnitine esters in fatty acyl transport (Fritz and Marquis), 1226
Acyl-D-alanyl-D-alanine, similarity to penicillins (Tipper and Strominger), 1133
ADAMSON, R. H., R. L. DIXON, F. L. FRANCIS, and D. P. RALL. Comparative Biochemistry of Drug Metabolism by Azo and Nitro Reductase, 1386
Adenosine triphosphatase, brain transport (Hokin *et al.*), 177
Adenosine triphosphate content in red cells during malaria (Brewer and Powell), 741
Adenovirus induction of hamster tumors (Huebner *et al.*), 381
Adenovirus multiplication (Piña and Green), 547
Adeno 7-SV40 virus in cell transformation (Black and Todaro), 374
Adenovirus-SV40 hybrids (Rowe), 711; (Rapp *et al.*), 717; (Easton and Hiatt), 1100
Adenylosuccinase repressibility (Berberich and Gots), 1254
Adipose tissue, citrate cleavage in (Kornacker and Ball), 899
Aerobacter aerogenes, pentose and pentitol utilization by (Mortlock *et al.*), 572
Age and cancer incidence (Little), 1779
Agglutination factor, receptor for, in tumor sera (Tal), 1318
Agglutinin, wheat germ, effects on malignant and normal cells (Aub *et al.*), 396, 400
AGRANOFF, B. W., R. E. DAVIS, and J. J. BRINK. Memory Fixation in the Goldfish, 788
AHLBERG, J. H., E. N. NILSON, and J. L. WALSH. Convergence Properties of Generalized Splines, 344
ALBRITTON, W. L. *See* Kenney, F. T., 1693
ALEEM, M. I. H., G. E. HOCH, and J. E. VARNER. Water as the Source of Oxidant and Reductant in Bacterial Chemosynthesis, 869
Alexander-Spanier cohomology (Watts), 1027
Algebraic structure of dynamical systems (Kalman), 1503
Aliphatic liquids, methyl effects on (Hildebrand and Dymond), 1001
Alkylation of polyribonucleotides (Abell *et al.*), 608
ALLARD, R. W. *See* Jain, S. K., 1436, 1804
ALLEN, R. D., D. W. FRANCIS, and H. NAKAJIMA. Cyclic Birefrigence Changes in Pseudopods of *Chaos carolinensis* Revealing the Localization of the Motive Force in Pseudopod Extension, 1153
ALLFREY, V. G. *See* Davidson, E. H., 696
———. *See* Littau, V. C., 1204
ALLIS, J. W., and J. D. FERRY. Dynamic Viscoelastic Behavior of Dilute Paramyosin Solutions, 369
ALSOP, L. E. *See* Dorman, J., 364
ALSTON, R. E., H. RÖSLER, K. NAIFEH, and T. J. MABRY. Hybrid Compounds in Natural Interspecific Hybrids, 1458
Amino acid composition of Pleistocene fossil protein (Ho), 26
Amino acid sequence of cytochrome *c* (Heller and Smith), 1671
Amino acids, codon assignments for (Söll *et al.*), 1378
δ-Aminolevulinic acid synthetase and hemoglobin synthesis (Levere and Granick), 134
Analytic functions, Weierstrass (Menger), 1025
Analytic varieties, Stokes' theorem on (Bungart), 343
ANAND, S. P. S. On Chandrasekhar's Limiting Mass for Rotating White Dwarf Stars, 23
ANDERSON, O. L. Two Methods for Estimating Compression and Sound Velocity at Very High Pressures, 667
ANDERSON, T. F. *See* Bayer, M. E., 1592
ANDERSON, W. F., L. GORINI, and L. BRECKENRIDGE. Role of Ribosomes in Streptomycin-Activated Suppression, 1076
ANDOH, T., and E. CHARGAFF. Formation and Fate of Abnormal Ribosomes of *E. coli* Cells Treated with 5-Fluorouracil, 1181
ANDREWS, F. C. Statistical Mechanics and Irreversibility, 13
Androgen and mating in castrated quail (Beach and Inman), 1426
ANFINSEN, C. B. *See* Steers, E., Jr., 1174
Anilides and phenylureas (Kamrin *et al.*), 1285
Antarctica, phytoplankton in (Burkholder and Mandelli), 437
Antibodies to sRNA (Plescia *et al.*), 1281
Antibody conformation, hapten-induced change in (Grossberg *et al.*), 942
Antibody formation (Dreyer and Bennett), 864
Antibody interaction and hemolysis (Weiler *et al.*), 1310
Antibody molecules, tryptic peptides from (Doolittle and Singer), 1773
Antibody-producing cells, allelic γ-globulin genes in (Weiler), 1765
Antibody-producing tissues, RNA in (Mach and Vassalli), 975
Antibody synthesis and streptomycin (Krueger), 144
Antigen-antibody complexes, lymphocyte sensitization by (Uhr), 1599
APOSHIAN, H. V. *See* Trilling, D. M., 622
ARNON, D. I., H. Y. TSUJIMOTO, and B. D. MCSWAIN. Quenching of Chloroplast

Fluorescence by Photosynthetic Phosphorylation and Electron Transfer, 927
Atomic H bombardment of nucleic-acid bases, free radicals formed by (Herak and Gordy), 1287
Atomic nuclei, spheron model of (Pauling), 989
ATP and dATP in CDP reductase system (Holmgren *et al.*), 830
ATTARDI, G., P. HUANG, and S. KABAT. Recognition of Ribosomal RNA Sites in DNA, II. The HeLa Cell System, 185
AUB, J. C., B. H. SANFORD, and M. N. COTE. Studies on Reactivity of Tumor and Normal Cells to a Wheat Germ Agglutinin, 396
———, B. H. SANFORD, and L. WANG. Reactions of Normal and Leukemic Cell Surfaces to a Wheat Germ Agglutinin, 400
AUBERT, J.-P. *See* Schaeffer, P., 704
AURBACH, G. D. *See* Potts, J. T., Jr., 1743
Autobiotics (Együd), 200
Avena coleoptile protoplasts (Ruesink and Thimann), 56
AVERS, C. J., M. W. RANCOURT, and F. H. LIN. Intracellular Mitochondrial Diversity in Various Strains of *Saccharomyces cerevisiae*, 527
Avian myeloblastosis virus (Robinson and Baluda), 1686
Axonal flow of mitochondria in nerve fibers (Weiss and Pillai), 48; (Taylor and Weiss), 1521
Axons: squid giant, excitation of (Tasaki *et al.*), 763; lobster, GABA in (Kravitz *et al.*), 778
Azo reductase (Adamson *et al.*), 1386

BABICH, F. R., A. L. JACOBSON, and S. BUBASH. Cross-Species Transfer of Learning: Effect of Ribonucleic Acid from Hamsters on Rat Behavior, 1299
Bacillus species, gene conservation in (Dubnau *et al.*), 491, 724
Bacillus subtilis (Masters and Pardee), 64; (Oishi and Sueoka), 483; (Trilling and Aposhian), 622; (Massie and Zimm), 1636
Bacterial chemosynthesis (Aleem *et al.*), 869
Bacteriophage (*see* Phage)
BAKERMAN, H. A. *See* Larrabee, A. R., 267
BALL, E. G. *See* Kornacker, M. S., 899
BALUDA, M. A. *See* Robinson, W. S., 1686
Banach spaces: nonlinear operators in (Browder), 337, 1041; and linear continuous operators (Bogdanowicz), 351
BARON, S. *See* Todaro, G. J., 752
BASERGA, R., R. D. ESTENSEN, R. O. PETERSEN, and J. P. LAYDE. Inhibition of DNA Synthesis in Ehrlich Ascites Cells by Actinomycin D, I. Delayed Inhibition by Low Doses, 745
———, R. D. ESTENSEN, and R. O. PETERSEN. Inhibition of DNA Synthesis in Ehrlich Ascites Cells by Actinomycin D, II. The Presynthetic Block in the Cell Cycle, 1141
BASILICO, C., and G. DI MAYORCA. Radiation Target Size of the Lytic and the Transforming Ability of Polyoma Virus, 125
BAVETTA, L. A. *See* Bekhor, I. J., 615
BAYER, M. E., and T. F. ANDERSON. The Surface Structure of *Escherichia coli*, 1592
BEACH, F. A., and N. G. INMAN. Effects of Castration and Androgen Replacement on Mating in Male Quail, 1426
BEAUDREAU, G. *See* Spiegelman, S., 919
BECK, A., and L. E. ORGEL. The Formation of Condensed Phosphate in Aqueous Solution, 664
BECK, W. S., and J. HARDY. Requirement of Ribonucleotide Reductase for Cobamide Coenzyme, a Product of Ribosomal Activity, 286
BEKHOR, I. J., Z. MOHSENI, M. E. NIMNI, and L. A. BAVETTA. The Biosynthesis of Microsomal-Bound Collagen Precursors in Rabbit Embryo Skin *in vitro*, 615
BELLMAN, R., and R. KALABA. On a New Approach to the Numerical Solution of a Class of Partial Differential Integral Equations of Transport Theory, 1293
———. A New Approach to the Numerical Solution of a Class of Linear and Nonlinear Integral Equations of Fredholm Type, 1501
BELSKY, T. *See* Burlingame, A. L., 1406
BENEDICT, A. A. *See* Dreesman, G. R., 822
BENESCH, R. *See* Benesch, R. E., 535
BENESCH, R. E., R. BENESCH, and G. MACDUFF. Subunit Exchange and Ligand Binding: A New Hypothesis for the Mechanism of Oxygenation of Hemoglobin, 535
BENJAMIN, T. L. Relative Target Sizes for the Inactivation of the Transforming and Reproductive Abilities of Polyoma Virus, 121
BENNETT, J. C. *See* Dreyer, W. J., 864
BERBERICH, M. A., and J. S. GOTS. A Structural Gene Mutation in *Salmonella typhimurium* Resulting in Repressibility of Adenylosuccinate, 1254
———. *See* Goldberger, R. F., 279
BERLOWITZ, L. Analysis of Histone *in situ* in Developmentally Inactivated Chromatin, 476
BERMAN, G. R. *See* Danon, D., 873
BERNFIELD, M. *See* Brimacombe, R., 954
BERTSCH, W. F. *See* Kamrin, M., 1285
Beta sieve element plastids (Esau), 429
BHK-21 cells and SV40 DNA (Black and Rowe), 1126
BHUYAN, B. K., and C. G. SMITH. Differential Interaction of Nogalamycin with DNA of Varying Base Composition, 566
BIAGLOW, J. E. *See* Sable, H. Z., 808
Bidiurnal cycle in *P. potto* feeding habit (Cowgill), 420
BILTONEN, R., R. LUMRY, V. MADISON, and H. PARKER. Studies of the Chymotrypsinogen Family, III. The Optical Rotatory Dispersion of α-Chymotrypsin, 1018
———, R. LUMRY, V. MADISON, and H. PARKER Studies of the Chymotrypsinogen Family, IV. The Conversion of Chymotrypsinogen A to α-Chymotrypsin, 1412
Bing, problem of (Wilder), 683
Biogenic steranes and triterpanes (Burlingame *et al.*), 1406
Biological theory (Elsasser), 1431

Biomolecules, spin-labeled (Stone *et al.*), 1010
Biosynthesis of: chondroitin-sulfate protein complex (Telser *et al.*), 912; glycoproteins (Cook *et al.*), 247, (Eylar and Cook), 1678; mRNA (Goldstein *et al.*), 1669; *Neurospora* enzymes (Gross), 1538; nucleic acid (Spiegelman *et al.*), 919; polygalacturonic acid chain of pectin (Villemez *et al.*), 1626; proteins (Hendler), 1233; RNA (Mach and Vassalli), 975; *Salmonella* 0-antigen (Weiner *et al.*), 288, (Wright *et al.*), 235
BIRD, R. E. *See* Lark, K. G., 1444
Birefringence changes in pseudopods (Allen *et al.*), 1153
BISHOP, J. M., D. F. SUMMERS, and L. LEVINTOW. Characterization of Ribonuclease-Resistant RNA from Poliovirus-Infected HeLa Cells, 1273
BISHOP, R. L., and S. I. GOLDBERG. Rigidity of Positively Curved Kaehler Manifolds, 1037
BLACK, P. H., and G. J. TODARO. *In vitro* Transformation of Hamster and Human Cells with the Adeno 7-SV40 Hybrid Virus, 374
——— and W. P. ROWE. Increase of Malignant Potential of BHK-21 Cells by SV40 DNA without Persistent New Antigen, 1126
BLUMBERG, J. M. *See* Price, H. M., 1398
BOGDANOWICZ, W. M. Integral Representation of Linear Continuous Operators from the Space of Lebesgue-Bochner Summable Functions into any Banach Space, 351
BONNER, J. *See* Huang, R. C., 960
———. *See* Dahmus, M. E., 1370
BOOTH, B. A., W. A. CREASY, and A. C. SARTORELLI. Alterations in Cellular Metabolism Associated with Cell Death Induced by Uracil Mustard and 6-Thioguanine, 1803
BORKENHAGEN, L. F. *See* Shaw, D. A., 837
BORST, P., and C. WEISSMANN. Replication of Viral RNA, VIII. Studies on the Enzymatic Mechanism of Replication of MS2 RNA, 982
BOYER, J. S., and E. B. KNIPLING. Isopiestic Technique for Measuring Leaf Water Potentials with a Thermocouple Psychrometer, 1044
Brain "transport ATPase" (Hokin *et al.*), 177
BRAUN, A. C. *See* Wood, H. N., 1532
BRAUN, W. *See* Plescia, O. J., 1281
BRECKENRIDGE, L. *See* Anderson, W. F., 1076
BREUNINGER-PECK, E. *See* Weiler, E., 1310
BREWER, G. J., and R. D. POWELL. A Study of the Relationship between the Content of Adenosine Triphosphate in Human Red Cells and the Course of Falciparum Malaria: A New System That May Confer Protection against Malaria, 741
Brightness and loudness, cross-modality matching of (Stevens and Marks), 407
BRIMACOMBE, R., J. TRUPIN, M. NIRENBERG, P. LEDER, M. BERNFIELD, and T. JAOUNI. RNA Codewords and Protein Synthesis, VIII. Nucleotide Sequences of Synonym Codons for Arginine, Valine, Cysteine, and Alanine, 954
BRINK, J. J. *See* Agranoff, B. W., 788
BROCK, T. D. The Purification and Characterization of an Intracellular Sex-Specific Mannan Protein from Yeast, 1104
BROWDER, F. E. Mapping Theorems for Noncompact Nonlinear Operators in Banach Spaces, 337
———. Nonexpansive Nonlinear Operators in a Banach Space, 1041
Brucite and gypsum kinks (Turner and Weiss), 359
BUBASH, S. *See* Babich, F. R., 1299
BUCHANAN, B. B., and M. C. W. EVANS. The Synthesis of α-Ketoglutarate from Succinate and Carbon Dioxide by a Subcellular Preparation of a Photosynthetic Bacterium, 1212
BUCKMAN, T. *See* Stone, T. J., 1010
BÜHLER, W., H. FEIN, D. GOLDSMITH, J. NEYMAN, and P. S. PURI. Locally Optimal Test for Homogeneity with Respect to Very Rare Events, 673
BULLOCK, T. H., and S. CHICHIBU. Further Analysis of Sensory Coding in Electroreceptors of Electric Fish, 422
BUNGART, L. Stokes' Theorem on Real Analytic Varieties, 343
BURDICK, C. J. *See* Littau, V. C., 1204
BURKHOLDER, P. R., and E. F. MANDELLI. Carbon Assimilation of Marine Phytoplankton in Antarctica, 437
BURLINGAME, A. L., P. HAUG, T. BELSKY, and M. CALVIN. Occurrence of Biogenic Steranes and Pentacyclic Triterpanes in an Eocene Shale (52 Million Years) and in an Early Precambrian Shale (2.7 Billion Years): A Preliminary Report, 1406
BUTEL, J. S. *See* Rapp, F., 717

C-reactive protein (Gotschlich and Edelman), 558
CALVIN, M. *See* Burlingame, A. L., 1406
Cancer incidence by age in Connecticut and New York (Little), 1779
Carbon assimilation of phytoplankton (Burkholder and Mandelli), 437
Carnitine palmityltransferase in fatty acyl transport (Fritz and Marquis), 1226
β-Carotene cleavage into vitamin A (Olson and Hayaishi), 1364
CASEY, M. J. *See* Huebner, R. J., 381
Castration and mating of male quail (Beach and Inman), 1426
Cations, effects on pyruvic kinase (Sorger *et al.*), 1614
CECERE, M. A. *See* Thach, R. E., 1167
Cell depletion analysis (Puck), 1797
Cell-free biosynthesis of: nucleic acid (Spiegelman *et al.*), 919; glycoprotein (Eylar and Cook), 1678
Cell-free systems of protein synthesis (Ganoza *et al.*), 294
Cell membrane receptor for agglutination factor (Tal), 1318
Cell morphology and sugars (Cox and Gesner), 1571
Cell turnover in mammalian tissues (Puck), 1797
Cells: primitive hemopoietic (Gurney and Fried), 1148; malignant (Johnsson and Hegyeli), 1375

Cellular metabolism in cell death from uracil mustard (Booth *et al.*), 1803
Cell wall glycopeptide synthesis (Matsuhashi *et al.*), 587
Cell wall mucopeptide synthesis (Wise and Park), 75
Central limit theorem (LeCam), 354
CHALKLEY, G. R., and H. R. MAUREK. Turnover of Template-Bound Histone, 498
Chandrasekhar's limiting mass for rotating white dwarf stars (Anand), 23
CHANG, A. Y. *See* Clark, J. M., Jr., 1193
CHANG, G. W. *See* Rosenthaler, J., 152
CHANOCK, R. M. *See* Huebner, R. J., 381
Chaos carolinensis pseudopods (Allen *et al.*), 1153
CHARGAFF, E. *See* Rudner, R., 904
———. *See* Andoh, T., 1181
Charge-transfer complexes of indoles (Green and Malrieu), 659
Chemical enhancement of superconductivity (McConnell *et al.*), 371
Chemosynthesis, bacterial (Aleem *et al.*), 869
CHEN, R., D. HENDERSON, and S. G. DAVISON. Quantum Corrections to the Equation of State of Gases at High Temperatures and Densities, 1514
CHENG, S.-C. *See* Waelsch, H., 1249
CHICHIBU, S. *See* Bullock, T. H., 422
Chick blastoderm (Levere and Granick), 134
Chicken γG immunoglobulin, dissociation (Dreesman and Benedict), 822
Chlamydomonas reinhardi (Gillham), 1560; (Gorman and Levine), 1665
Chloroplast fluorescence (Arnon *et al.*), 927
Chloroplasts, tobacco, and DNA (Shipp *et al.*), 207, 1470
Chloroquine inhibition of DNA and RNA polymerase (Cohen and Yielding), 521
Chondroitin-sulfate protein complex (Telser *et al.*), 912
Chromatin: inactivated, histone in (Berlowitz), 476; liver, template activity (Dahmus and Bonner), 1370
Chromatin structure, histones in (Littau *et al.*), 1204
Chromosomal origin of tRNA (Woods and Zubay), 1705
Chromosome changes induced by microorganism infection (Diaz and Pavan), 1321
Chromosome, loci for ribosomal RNA on (Oishi and Sueoka), 483
Chromosome recessiveness of regulator gene (Markovitz and Rosenbaum), 1084
Chromosome structure in phage T4 (Séchaud *et al.*), 1333
α-Chymotrypsin and trypsin interaction with proflavine (Glazer), 171
Chymotrypsinogen A, molecular weight measurements of (LaBar), 31
Chymotrypsinogen family (Biltonen *et al.*), 1018; 1412
Citrate cleavage in adipose tissue (Kornacker and Ball), 899
CLARK, J. M., JR., A. Y. CHANG, S. SPIEGELMAN, and M. E. REICHMANN. The *in vitro* Translation of a Monocistronic Message, 1193
Closedness of functions (Whyburn), 688
Clostridium pasteurianum, rubredoxin in (Lovenberg and Sobel), 193
CLOUD, P. E., JR., and H. HAGEN. Electron Microscopy of the Gunflint Microflora: Preliminary Results, 1
Cobalt-free vitamin B_{12} compound (Toohey), 934
Cobamide coenzyme in ribonucleotide reductase (Beck and Hardy), 286
Codewords, RNA, and protein synthesis (Brimacombe *et al.*), 954
Codon assignments (Söll *et al.*), 1378
Coenzyme cobamide in ribonucleotide reductase (Beck and Hardy), 286
Coenzyme interactions (Sable and Biaglow), 808
CO_2 fixation in the nervous system (Waelsch *et al.*), 1249
COHEN, S. N., and K. L. YIELDING. Inhibition of DNA and RNA Polymerase Reactions by Chloroquine, 521
Cohomology, Alexander-Spanier (Watts), 1027
Cold-sensitive mutants of *E. coli* (O'Donovan and Ingraham), 451
COLE, T. *See* Heller, H. C., 1486
Coleoptile protoplasts (Ruesink and Thimann), 56
Coliphage inactivation by X rays (Freifelder), 128
Collagen molecule degradation by collagenolytic enzyme (Gross and Nagai), 1197
Collagen precursors, microsomal-bound (Bekhor *et al.*), 615
Compression and sound velocity (Anderson), 667
Conformal transformations of Riemannian manifold (Hsiung), 1509
Connecticut (Little), 1779
Continuity of multifunctions (Whyburn), 1494
Control mechanisms (Freifelder), 128; (Levere and Granick), 134; (Krueger), 144; (Goldberger and Berberich), 279; (Schaeffer *et al.*), 704; (Baserga *et al.*), 745, 1141; (Todaro and Baron), 752; (Woodson and Joklik), 946; (Moss and Ingram), 967; (Salb and Marcus), 1353; (Welch), 1359; (Gross), 1538; (Sorger *et al.*), 1614; (Kenney and Albritton), 1693
Convection of mitochondria in nerve fibers (Weiss and Pillai), 48
Convergence properties of generalized splines (Ahlberg *et al.*), 344
Convexity and martingales in linear spaces (McShane), 37
COOK, G. M. W., M. T. LAICO, and E. H. EYLAR. Biosynthesis of Glycoproteins of the Ehrlich Ascites Carcinoma Cell Membranes, 247
———. *See* Eylar, E. H., 1678
COOPER, H. L. *See* Rubin, A. D., 469
COPE, F. W. Nuclear Magnetic Resonance Evidence for Complexing of Sodium Ions in Muscle, 225
CORA-FIGUEROA, E. *See* Plescia, O. J., 1281
Core-mantle boundary model (Dorman *et al.*), 364
Cosmological models (Omer *et al.*), 657
Cosmology, epochal, and red shift discretization (Thomas), 994
CÔTE, L. J. *See* Waelsch, H., 1249
COTE, M. N. *See* Aub, J. C., 396
COWGILL, U. M. A Bidiurnal Cycle in the Feeding Habit of *Perodicticus potto*, 420

COX, R. P., and B. M. GESNER. Effect of Simple Sugars on the Morphology and Growth Pattern of Mammalian Cell Cultures, 1571
CRASEMANN, J. M. *See* Stahl, F. W., 1342
CRAVEN, G. R. *See* Steers, E., Jr., 1174
CREASY, W. A. *See* Booth, B. A., 1803
CRONENWETT, C. S., and R. P. WAGNER. Over-All Synthesis of Isoleucine by Membrane Fractions of *Salmonella typhimurium*, 1643
CRONIN, J. R. *See* Harbury, H. A., 1658
Cross-modality matching of brightness and loudness (Stevens and Marks), 407
Cross sections to fiber spaces (Thomas), 40
Crown-gall tumor cells (Wood and Braun), 1532
CSAPO, A. I., and C. A. PINTO-DANTAS. The Effect of Progesterone on the Human Uterus, 1069
Cytochrome *c*: protein-heme interactions in (Urry), 640; optical rotatory dispersion of (Myer and Harbury), 1391; amino acid sequence of (Heller and Smith), 1621; heme peptide from (Harbury *et al.*), 1658
Cytochrome *f* and plastocyanin (Gorman and Levine), 1665
Cytoplasmic factors in embryogenesis (Davidson *et al.*), 696
Cytoplasts (Gibor), 1527

DAHMUS, M. E., and J. BONNER. Increased Template Activity of Liver Chromatin, A Result of Hydrocortisone Administration, 1370
DALES, S. Effects of Streptovitacin A on the Initial Events in the Replication of Vaccinia and Reovirus, 462
DANKERT, M. *See* Wright, A., 235
DANON, D., T. ZEHAVI-WILLNER, and G. R. BERMAN. Alterations in Polyribosomes of Reticulocytes Maturing *in vivo*, 873
DARNELL, J. E., JR. *See* Summers, D. F., 505
DAVIDSON, E. A. *See* Marler, E., 648
DAVIDSON, E. H., G. W. HASLETT, R. J. FINNEY, V. G. ALLFREY, and A. E. MIRSKY. Evidence for Prelocalization of Cytoplasmic Factors Affecting Gene Activation in Early Embryogenesis, 696
DAVIDSON, O. W. *See* Segal, S. J., 782
DAVIS, R. E. *See* Agranoff, B. W., 788
DAVISON, S. G. *See* Henderson, D., 21
———. *See* Chen, R., 1514
DEARMAN, H. H. *See* White, J. R., 887
Decarboxylase, histidine (Rosenthaler *et al.*), 152
Deformational kinks in brucite and gypsum (Turner and Weiss), 359
DELPIERRE, G. R., and J. S. FRUTON. Inactivation of Pepsin by Diphenyldiazomethane, 1161
DEMOSS, J. A., and J. WEGMAN. An Enzyme Aggregate in the Tryptophan Pathway of *Neurospora crassa*, 241
2′-Deoxyadenosine inhibition of *P. testosteroni* enzyme induction (Welch), 1359
Deoxyribonuclease after SP3 infection of *B. subtilis* (Trilling and Aposhian), 622
Deoxyribonucleotides, enzymatic synthesis of (Holmgren *et al.*), 830
Deoxyribo-oligonucleotidase separation by T2 infection (Short and Koerner), 595
DE WAARD, A., A. V. PAUL, and I. R. LEHMAN. The Structural Gene for Deoxyribonucleic Acid Polymerase in Bacteriophages T4 and T5, 1241
DIAMANDOPOULOS, G. T., and J. F. ENDERS. Studies on Transformation of Syrian Hamster Cells by Simian Virus 40 (SV40): Acquisition of Oncogenicity by Virus-Exposed Cells Apparently Unassociated with the Viral Genome, 1092
DIAZ, M., and C. PAVAN. Changes in Chromosomes Induced by Microorganism Infection, 1321
DIETRICH, C. P. *See* Matsuhashi, M., 587
Differential integral equations of transport theory (Bellman and Kalaba), 1293
DI MAYORCA, G. *See* Basilico, C., 125
Diphenyldiazomethane, pepsin inactivation by (Delpierre and Fruton), 1161
Directed families of sets and closed functions (Whyburn), 688
Disaccharidases, intestinal (Doell *et al.*), 1268
Discretization, red shift (Thomas), 994
DIXON, R. L. *See* Adamson, R. H., 1386
DNA: ribosomal RNA sites in (Attardi *et al.*), 185; associated with tobacco chloroplasts (Shipp *et al.*), 207, 1470; RF-, X-ray and heat inactivation of (Ginoza and Miller), 551; nogalamycin interaction with (Bhuyan and Smith), 566; in RNA synthesis (Maitra and Hurwitz), 815; as template for protein synthesis (McCarthy and Holland), 880; increase of malignant cell potential by (Black and Rowe), 1126; conserved units of, in *E. coli* (Lark and Bird), 1444; reaction with hydrogen (Heller and Cole), 1486; molecular weight of, in *E. coli* and *B. subtilis* (Massie and Zimm), 1636; hot phenol in preparation of (Massie and Zimm), 1641; rat liver mitochondrial (Schneider and Kuff), 1650
DNA methyl transferase, lipopolysaccharide inhibitor of (Falaschi and Kornberg), 1713
DNA polymerase: chloroquine inhibition of (Cohen and Yielding), 521; T4 and T5 (de Waard *et al.*), 1241
DNA replication: T4 phage (Kozinski and Lin), 273, (Kozinski and Kozinski), 634; after thymine starvation (Pauling and Hanawalt), 1728
DNA-RNA complex in genetic transcription (Hayashi), 1736
DNA synthesis: actinomycin D-inhibited (Baserga *et al.*), 745, 1141; polyoma virus-induced (Gershon *et al.*), 1584
DODSWORTH, R. O. *See* Harlow, H. F., 90
DOELL, R. G., G. ROSEN, and N. KRETCHMER. Immunochemical Studies of Intestinal Disaccharidases during Normal and Precocious Development, 1268
DOOLITTLE, R. F., and S. J. SINGER. Tryptic Peptides from the Actives Sites of Antibody Molecules, 1773
DORFMAN, A. *See* Telser, A., 912
DORMAN, J., J. EWING, and L. E. ALSOP. Oscillations of the Earth: New Core-Mantle Boundary Model Based on Low-Order Free Vibrations, 364

DOTY, P. *See* Thach, R. E., 1167
DREESMAN, G. R., and A. A. BENEDICT. Reductive Dissociation of Chicken γG Immunoglobulin in Neutral Solvents without a Dispersing Agent, 822
DREYER, W. J., and J. C. BENNETT. The Molecular Basis of Antibody Formation: A Paradox, 864
Drosophila fertilization (Hildreth), 736
Drosophila paulistorum, hybrid sterility in (Ehrman and Williamson), 481
Drug metabolism (Adamson *et al.*), 1386
Drugs, hallucinogenic activity of (Snyder and Merril), 258
DUBNAU, D., I. SMITH, P. MORELL, and J. MARMUR. Gene Conservation in *Bacillus* Species, I. Conserved Genetic and Nucleic Acid Base Sequence Homologies, 491
———, I. SMITH, and J. MARMUR. Gene Conservation in *Bacillus* Species, II. The Location of Genes Concerned with the Synthesis of Ribosomal Components and Soluble RNA, 724
DUESBERG, P. H., and W. S. ROBINSON. Isolation of the Nucleic Acid of Newcastle Disease Virus (NDV), 794
DU VIGNEAUD, V. *See* Yamashiro, D., 166
DYMOND, J. *See* Hildebrand, J. H., 1001
Dynamical systems (Kalman), 1503

Earth, oscillations of (Dorman *et al.*), 364
EASTON, J. M., and C. W. HIATT. Possible Incorporation of SV40 Genome within Capsid Proteins of Adenovirus 4, 1100
Eaton agent and *Streptococcus* MG (McGee *et al.*), 457
ECKER, R. E. The Role of Ribosomal RNA in the Control of Ribosomal Protein Synthesis, 1465
EDELMAN, G. M. *See* Gotschlich, E. C., 558
EGYŪD, L. G. Studies on Autobiotics: Chemical Nature of Retine, 200
Ehrlich ascites cell membranes, glycoprotein biosynthesis (Cook *et al.*), 247; (Eylar and Cook), 1678
Ehrlich ascites cells, DNA synthesis inhibition in (Baserga *et al.*), 745, 1141
EHRMAN, L., and D. L. WILLIAMSON. Transmission by Injection of Hybrid Sterility to Nonhybrid Males in *Drosophila paulistorum:* Preliminary Report, 481
EISENSTARK, A. Mutagen-Induced Hybridization of *Salmonella typhimurium* LT2 × *Escherichia coli* K12 Hfr, 117
———. Transduction of *Escherichia coli* Genetic Material by Phage P22 in *Salmonella typhimurium* × *E. coli* Hybrids, 1557
Electron microscopy of Gunflint microflora (Cloud and Hagen), 1
Electron microscopy of satellite TNV (Fridborg *et al.*), 513
Electron spin resonance of free radicals in PHTP (Griffith), 1296
Electron transfer protein from *C. pasteurianum* (Lovenberg and Sobel), 193
Electroreceptors of electric fish (Bullock and Chichibu), 422
ELIAS, J. J. *See* Juergens, W. G., 629
ELSASSER, W. M. Semiformal Representation of Organismic Concepts, 1431
Embryogenesis, gene activation in (Davidson *et al.*), 696
EMRICH, J. *See* Séchaud, J., 1333
ENDERS, J. F. *See* Diamandopoulos, G. T., 1092
ENGELHARDT, D. L., R. E. WEBSTER, R. C. WILHELM, and N. D. ZINDER. *In vitro* Studies on the Mechanism of Suppression of Nonsense Mutation, 1791
Environment, Martian (Abelson), 1490
Enzymatic cleavage of β-carotene into vitamin A (Olson and Hayaishi), 1365
Enzymatic oxidation of steroids (Shaw *et al.*), 837
Enzymatic synthesis of deoxyribonucleotides (Holmgren *et al.*), 830
Enzyme aggregate in tryptophan pathway of *N. crassa* (DeMoss and Wegman), 241
Enzyme induction in *P. testosteroni* (Welch), 1359
Enzyme synthesis: during *B. subtilis* cell cycle (Masters and Pardee), 64; in *Neurospora* (Gross), 1538; repression of (Kenney and Albritton), 1693
Enzymes: from T4 phage-infected *E. coli* (Richardson), 158; for histidine biosynthesis (Goldberger and Berberich), 279; template stability of (Pitot *et al.*), 845
Eocene shale, biogenic steranes and triterpanes in (Burlingame *et al.*), 1406
Episomal dominance of regulator gene (Markovitz and Rosenbaum), 1084
Equation of state, quantum corrections to (Henderson and Davison), 21; (Chen *et al.*), 1514
Equatorial sparrow (Miller), 97
ESAU, K. Fixation Images of Sieve Element Plastids in *Beta*, 429
Escherichia coli (Holmgren *et al.*), 830; (Fox and Kennedy), 891; (Steers *et al.*), 1174; (Lark and Bird), 1444; (Eisenstark), 1557; (Northrop), 1632; (Massie and Zimm), 1636; (Goldstein *et al.*), 1669; (Hayward and Green), 1675
Escherichia coli: hybridization of *S. typhimurium* and (Eisenstark), 117; enzyme from T4 phage-infected (Richardson), 158; cold-sensitive mutants of (O'Donovan and Ingraham), 451; cells treated with 5-fluorouracil (Andoh and Chargaff), 1181; surface structure of (Bayer and Anderson), 1592
Escherichia coli polymerases, template for (Shatkin), 1721
ESTENSEN, R. D. *See* Baserga, R., 745
———. *See* Baserga, R., 1141
ESTES, W. K. A Technique for Assessing Variability of Perceptual Span, 403
Estrogen regulatory action, RNA in (Segal *et al.*), 782
EVANS, H. J. *See* Sorger, G. J., 1614
EVANS, M. C. W. *See* Buchanan, B. B., 1212
Evolution of genetic code (Woese), 1546
EWING, J. *See* Dorman, J., 364
———. *See* Cook, G. M. W., 247
Existence of complete minimal surfaces (Klotz and Sario), 42
Exploration, planetary (Pickering), 1471
EYLAR, E. H., and G. M. W. COOK. The

Cell-Free Biosynthesis of the Glycoprotein of Membranes from Ehrlich Ascites Carcinoma Cells, 1678
EYRING, H. *See* Grosh, J., 1004
———. *See* Jhon, M. S., 1419

FALASCHI, A., and A. KORNBERG. A Lipopolysaccharide Inhibitor of a DNA Methyl Transferase, 1713
Falciparum malaria (Brewer and Powell), 741
FALKOW, S. *See* McGee, Z. A., 457
FANGER, M. W. *See* Harbury, H. A., 1658
Fatty acid synthetase (Larrabee *et al.*), 267
Feeding habit of *P. potto* (Cowgill), 420
FEIN, H. *See* Bühler, W., 673
FERRY, J. D. *See* Allis, J. W., 369
Fertilization in *Drosophila* (Hildreth), 736
Fiber spaces, cross sections to (Thomas), 40
Fibers, myelinated nerve (Lorente de Nó and Honrubia), 82, 388, 770, 1061, 1303, 1606, 1803
Finite-time stability theory (Weiss and Infante), 44
FINNEY, R. J. *See* Davidson, E. H., 696
Fish electroreceptors, sensory coding in (Bullock and Chichibu), 422
Fixation images of sieve element plastids in *Beta* (Esau), 429
Fluorescence, chloroplast (Arnon *et al.*), 927
5-Fluorouracil effect on *E. coli* ribosomes (Andoh and Chargaff), 1181
FORD, R. E. *See* Sorger, G. J., 1614
FOSSITT, D. D. *See* Mortlock, R. P., 572
FOX, C. F., and E. P. KENNEDY. Specific Labeling and Partial Purification of the *M* Protein, a Component of the β-Galactoside Transport System of *Escherichia coli*, 891
FOX, E. N., and M. K. WITTNER. The Multiple Molecular Structure of the M Proteins of Group A Streptococci, 1118
FRANCIS, D. W. *See* Allen, R. D., 1153
FRANCIS, F. L. *See* Adamson, R. H., 1386
Fredholm-type integral equations (Bellman), 1501
Free radicals formed in nucleic-acid bases (Herak and Gordy), 1287
Free radicals in PHTP compounds (Griffith), 1296
FREIFELDER, D. Mechanism of Inactivation of Coliphage T7 by X Rays, 128
FRIDBORG, K., S. HJERTÉN, S. HÖGLUND, A. LILJAS, B. K. S. LUNDBERG, P. OXELFELT, L. PHILIPSON, and B. STRANDBERG. Purification, Electron Microscopy, and X-Ray Diffraction Studies of the Satellite Tobacco Necrosis Virus, 513
FRIED, W. *See* Gurney, C. W., 1148
FRITZ, I. B., and N. R. MARQUIS. The Role of Acylcarnitine Esters and Carnitine Palmityltransferase in the Transport of Fatty Acyl Groups across Mitochondrial Membranes, 1226
FRUTON, J. S. *See* Delpierre, G. R., 1161
Function, reduction of, near nondegenerate critical point (Morse), 1759
Functions, closedness of (Whyburn), 688
Functions, Weierstrass (Menger), 1025

β-Galactosidase induction and polycistronic mRNA (Kiho and Rich), 1751
β-Galactosidases from *E. coli* (Steers *et al.*), 1174
β-Galactoside transport system of *E. coli* (Fox and Kennedy), 891
GALSWORTHY, P. R. *See* Hokin, L. E., 177
GAMBLE, F. R. *See* McConnell, H. M., 371
Gamma-aminobutyric acid in lobster axons (Kravitz *et al.*), 778
Gamma-globulin genes in antibody-producing cells (Weiler), 1765
GANOZA, M. C., C. A. WILLIAMS, and F. LIPMANN. Synthesis of Serum Proteins by a Cell-Free System from Rat Liver, 294
Gases at high temperatures (Chen *et al.*), 1514
Gene activation in embryogenesis (Davidson *et al.*), 696
Gene conservation in *Bacillus* species (Dubnau *et al.*), 491, 724
Gene mutation in *S. typhimirium* (Berberich and Gots), 1254
Gene, regulator (Markovitz and Rosenbaum), 1084
Gene replication and enzyme synthesis in *B. subtilis* (Masters and Pardee), 64
Generalized splines (Ahlberg *et al.*), 344
Genetic code (Woese), 71, 1546; (Söll *et al.*), 1378
Genetic loci for ribosomal RNA (Oishi and Sueoka), 483
Genetic structure of T4 heterozygotes (Shalitin and Stahl), 1340; (Stahl *et al.*), 1342
Genetic transcription, DNA-RNA complex in (Hayashi), 1736
Genetic variability, stochastic model (Kimura), 731
Germ cell nuclear transfer (Smith), 101
GERSHON, D., P. HAUSEN, L. SACHS, and E. WINOCOUR. On the Mechanism of Polyoma Virus-Induced Synthesis of Cellular DNA, 1584
GESNER, B. M. *See* Cox, R. P., 1571
GIBOR, A. Surviving Cytoplasts *in vitro*, 1527
Gilia, incompatibility barriers (Grant), 1567
GILLHAM, N. W. Linkage and Recombination between Nonchromosomal Mutations in *Chlamydomonas reinhardi*, 1560
GINOZA, W., and R. C. MILLER. Kinetics of X-Ray and Heat Inactivation of φX174 RF-DNA, 551
GIRARDI, A. J. Prevention of SV40 Virus Oncogenesis in Hamsters, I. Tumor Resistance Induced by Human Cells Transformed by SV40, 445
GLAZER, A. N. Spectral Studies of the Interaction of α-Chymotrypsin and Trypsin with Proflavine, 171
Glutamine synthetase production, RNA synthesis in (Kirk), 1345
Glycine incorporation into cell wall glycopeptide (Matsuhashi *et al.*), 587
Glycopeptide synthesis (Matsuhashi *et al.*), 587
Glycoprotein biosynthesis (Cook *et al.*), 247; (Eylar and Cook), 1678
GOLDBERG, S. I. *See* Bishop, R. L., 1037
GOLDBERGER, R. F., and M. A. BERBERICH. Sequential Repression and Derepression

of the Enzymes for Histidine Biosynthesis in *Salmonella typhimurium*, 279
Goldfish, memory fixation in (Agranoff *et al.*), 788
GOLDSMITH, D. *See* Bühler, W., 673
GOLDSTEIN, A., J. B. KIRSCHBAUM, and A. ROMAN. Direction of Synthesis of Messenger RNA in Cells of *Escherichia coli*, 1669
GORDON, G. B. *See* Price, H. M., 1398
GORDON, M. P. *See* Merriam, V., 1261
GORDY, W. *See* Herak, J. N., 1287
GORINI, L. *See* Anderson, W. F., 1076
GORMAN, D. S., and R. P. LEVINE. Cytochrome *f* and Plastocyanin: Their Sequence in the Photosynthetic Electron Transport Chain of *Chlamydomonas reinhardi*, 1665
GOTS, J. S. *See* Berberich, M. A., 1254
GOTSCHLICH, E. C., and G. M. EDELMAN. C-Reactive Protein: A Molecule Composed of Subunits, 558
GRANICK, S. *See* Levere, R. D., 134
GRANT, V. Evidence for the Selective Origin of Incompatibility Barriers in the Leafy-Stemmed Gilias, 1567
Graphs, planar (Lefschetz), 1763
GREEN, J. P., and J. P. MALRIEU. Quantum Chemical Studies of Charge-Transfer Complexes of Indoles, 659
GREEN, M. *See* Piña, M., 547
GREEN, M. H. *See* Hayward, W. S., 1675
GRIFFITH, O. H. Electron Spin Resonance of Free Radicals in Perhydrotriphenylene Inclusion Compounds, 1296
———. *See* Stryer, L., 1785
GROSH, J., M. S. JOHN, T. REE, and H. EYRING. The Significant Structure Theory Applied to Liquid Hydrogen Halides, 1004
———. *See* Jhon, M. S., 1419
GROSS, J., and Y. NAGAI. Specific Degradation of the Collagen Molecule by Tadpole Collagenolytic Enzyme, 1197
GROSS, S. R. The Regulation of Synthesis of Leucine Biosynthetic Enzymes in *Neurospora*, 1538
GROSSBERG, A. L., G. MARKUS, and D. PRESSMAN. Change in Antibody Conformation Induced by Hapten, 942
Growth of malignant cells (Johnsson and Hegyeli), 1375
GUIRARD, B. M. *See* Rosenthaler, J., 152
Gunflint microflora (Cloud and Hagen), 1
GURNEY, C. W., and W. FRIED. The Regulation of Numbers of Primitive Hemopoietic Cells, 1148
Gypsum and brucite kinks (Turner and Weiss), 359

HAGEN, H. *See* Cloud, P. E., Jr., 1
HALL, Z. W. *See* Kravitz, E. A., 778
Hallucinogenic activity of drugs (Snyder and Merril), 258
Hamster cell transformation (Black and Todaro), 374
Hamster RNA, effect on rat behavior (Babich *et al.*), 1299
Hamster tumors (Huebner *et al.*), 381; (Girardi), 445
HANAWALT, P. *See* Pauling, C., 1728
Hapten effect on antibody conformation: (Grossberg *et al.*) 942; spin-labeled (Stryer and Griffith), 1785
HARARY, F., and E. PALMER. The Power Group of Two Permutation Groups, 680
HARBURY, H. A., J. R. CRONIN, M. W. FANGER, T. P. HETTINGER, A. J. MURPHY, Y. P. MYER, and S. N. VINOGRADOV. Complex Formation between Methionine and a Heme Peptide from Cytochrome *c*, 1658
———. *See* Myer, Y. P., 1391
HARDY, J. *See* Beck, W. S., 286
HARLOW, H. F., R. O. DODSWORTH, and M. K. HARLOW. Total Social Isolation in Monkeys, 90
HARLOW, M. K. *See* Harlow, H. F., 90
HARUNA, I., and S. SPIEGELMAN. Specific Template Requirements of RNA Replicases, 579
——— and S. SPIEGELMAN. Recognition of Size and Sequence by an RNA Replicase, 1189
———. *See* Spiegelman, S., 919
HASELKORN, R. *See* Shipp, W. S., 207, 1470
HASLETT, G. W. *See* Davidson, E. H., 696
HASSID, W. Z. *See* Villemez, C. L., 1626
HAUG, P. *See* Burlingame, A. L., 1406
HAUSEN, P. *See* Gershon, D., 1584
HAYAISHI, O. *See* Olson, J. A., 1364
HAYASHI, M. A DNA-RNA Complex as an Intermediate of *in vitro* Genetic Transcription, 1736
HAYATSU, H. *See* Söll, D., 1378
HAYWARD, W. S., and M. H. GREEN. Inhibition of *Escherichia coli* and Bacteriophage Lambda Messenger RNA Synthesis by T4, 1675
HEGYELI, A. *See* Johnsson, R., 1375
HeLa cells: noncapsid proteins in (Summers *et al.*), 505; RNase-resistant RNA from (Bishop *et al.*), 1273; mitotic, translational inhibition in (Salb and Marcus), 1353
HeLa DNA, ribosomal RNA sites in (Attardi *et al.*), 185
HELLER, H. C., and T. COLE. The Reaction of Hydrogen Atoms with Thymine and DNA, 1486
HELLER, J., and E. L. SMITH. The Amino Acid Sequence of Cytochrome *c* of *Neurospora crassa*, 1621
Heme peptide from cytochrome *c* (Harbury *et al.*), 1658
Heme-proteins (Urry), 640
Hemoglobin oxygenation (Benesch *et al.*), 535
Hemoglobin synthesis (Levere and Granick), 134; (Moss and Ingram), 967
Hemolysis by antibody interaction (Weiler *et al.*), 1310
Hemopoietic cells (Gurney and Fried), 1148
Hen oviduct homogenates (Hendler), 1233
HENDERSON, D., and S. G. DAVISON. Quantum Corrections to the Equation of State for a Steep Repulsive Potential, 21
———. *See* Chen, R., 1514
HENDLER, R. W. Lipoamino Acids as Precursors in the Synthesis of Authentic Proteins by Homogenates of Hen Oviduct, 1233

Hepatoma, stability of templates in (Pitot *et al.*), 845
HERAK, J. N., and W. GORDY. Free Radicals Formed by Hydrogen Atom Bombardment of the Nucleic-Acid Bases, 1287
HERSTEIN, I. N. A Counterexample in Noetherian Rings, 1036
Heterozygotes in T4 phage (Séchaud *et al.*), 1333; (Shalitin and Stahl), 1340; (Stahl *et al.*), 1342
HETTINGER, T. P. *See* Harbury, H. A., 1658
Hexokinases in rat (Katzen and Schimke), 1218
HIATT, C. W. *See* Easton, J. M., 1100
Hibernating periods, regulation of (Twente and Twente), 1058
HIGUCHI, T. *See* Weiner, I. M., 228
HILDEBRAND, J. H., and J. DYMOND. Effect of Methyl Groups upon the Solvent Power of Aliphatic Liquids, 1001
HILDRETH, P. E. Fertilization in *Drosophila*, II. Time of Inactivation of a Gene Effect, 736
Histidine biosynthesis (Goldberger and Berberich), 279
Histidine decarboxylase from *Lactobacillus* 30a (Rosenthaler *et al.*), 152
Histone: in inactivated chromatin (Berlowitz), 476; template-bound, turnover of (Chalkley and Maurer), 498; in chromatin structure (Littau *et al.*), 1204
Histone-bound RNA (Huang and Bonner), 960
HJERTÉN, S. *See* Fridborg, K., 513
HO, T. The Amino Acid Composition of Bone and Tooth Proteins in Late Pleistocene Mammals, 26
HOAGLAND, M. B. *See* Wilson, S. H., 600
HOCH, G. E. *See* Aleem, M. I. H., 869
HOFFMAN, B. M. *See* McConnell, H. M., 371
HÖGLUND, S. *See* Fridborg, K., 513
HOKIN, L. E., P. S. SASTRY, P. R. GALSWORTHY, and A. YODA. Evidence That a Phosphorylated Intermediate in a Brain Transport Adenosine Triphosphatase Is an Acyl Phosphate, 177
HOLLAND, I. B. *See* Spiegelman, S., 919
HOLLAND, J. J. *See* McCarthy, B. J., 880
HOLMGREN, A., P. REICHARD, and L. THELANDER. Enzymatic Synthesis of Deoxyribonucleotides, VIII. The Effects of ATP and dATP in the CDP Reductase System from *E. coli*, 830
Homogeneity in rare events (Bühler *et al.*), 673
HONRUBIA, V. *See* Lorente de Nó, R., 82, 388, 770, 1061, 1303, 1606, 1803
HORECKER, B. L. *See* Weiner, I. M., 228
Hormonal control of enzyme synthesis (Kenney and Albritton), 1693
Hormone activity of *Pyrrhocoris apterus* (Sláma and Williams), 411
Hormone-dependent differentiation of mammary gland (Juergens *et al.*), 629
Hormone, parathyroid, activity (Potts *et al.*), 1743
HSIUNG, C.-C. On the Group of Conformal Transformations of a Compact Riemannian Manifold, 1509
HUANG, A. S., and R. R. WAGNER. Inhibition of Cellular RNA Synthesis by Nonreplicating Vesicular Stomatitis Virus, 1579
———. *See* Wagner, R. R., 1112
HUANG, P. *See* Attardi, G., 185
HUANG, R. C., and J. BONNER. Histone-Bound RNA, A Component of Native Nucleohistone, 960
HUEBNER, R. J., M. J. CASEY, R. M. CHANOCK, and K. SCHELL. Tumors Induced in Hamsters by a Strain of Adenovirus Type 3: Sharing of Tumor Antigens and "Neoantigens" with Those Produced by Adenovirus Type 7 Tumors, 381
Human adenovirus analysis (Piña and Green), 547
Human cell transformation (Black and Todaro), 374
Human LDH isozyme patterns (Vesell), 111
Human uterus and progesterone (Csapo and Pinto-Dantas), 1069
HURWITZ, J. *See* Maitra, U., 815
Hybrid compounds in natural interspecific hybrids (Alston *et al.*), 1458
Hybrid sterility in *D. paulistorum* (Ehrman and Williamson), 481
Hybridization, incompatibility barriers (Grant), 1567
Hybrids, adenovirus-SV40 (Rowe), 711; (Rapp *et al.*), 717; (Easton and Hiatt), 1100
Hybrids, *E. coli* × *Salmonella* (Eisenstark), 117, 1557
Hydrocortisone in template activity of liver chromatin (Dahmus and Bonner), 1370
Hydrogen atom bombardment of nucleic-acid bases (Herak and Gordy), 1287
Hydrogen atoms, reaction with thymine and DNA (Heller and Cole), 1486
Hydrogen halides, liquid (Grosh *et al.*), 1004
Hydroxyproline and oxoproline synthesis (Salzman *et al.*), 542

Immunization and polyribosomal size in lymphoid cells (Norton *et al.*), 851
Immunochemical studies of intestinal disaccharidases (Doell *et al.*), 1268
Immunoelectrophoretic behavior of pyruvic kinase (Sorger *et al.*), 1614
Immunoglobulin, chicken γG, dissociation (Dreesman and Benedict), 822
Indole (Sable and Biaglow), 808
Indoles, charge-transfer complexes of (Green and Malrieu), 659
INFANTE, E. F. *See* Weiss, L., 44
INGRAHAM, J. L. *See* O'Donovan, G. A., 451
INGRAM, V. M. *See* Moss, B., 967
Inhibition of: DNA and RNA polymerase reactions by chloroquine (Cohen and Yielding), 521; DNA synthesis by actinomycin D (Baserga *et al.*), 745, 1141; interferon synthesis by puromycin (Wagner and Huang), 1112; mitosis (Salb and Marcus), 1353; RNA synthesis by virus (Huang and Wagner), 1579; mRNA synthesis by T4 (Hayward and Green), 1675
INMAN, N. G. *See* Beach, F. A., 1426
Integral equations, numerical solutions (Bellman), 1501
Integral representation of continuous operators in Banach spaces (Bogdanowicz), 351
Interferon as inhibitor of SV40 transformation (Todaro and Baron), 752

Interferon synthesis inhibited by puromycin (Wagner and Huang), 1112
Interspecific hybrids (Alston *et al.*), 1458
Intestinal disaccharidases (Doell *et al.*), 1268
Irradiation and mutation frequency in mice (Russell), 1552
Irreversibility and statistical mechanics (Andrews), 13
Isatin-β-thiosemicarbazone in inhibition of vaccinia virus multiplication (Woodson and Joklik), 946
Isolation effects on monkeys (Harlow *et al.*), 90
Isolation of NDV nucleic acid (Duesberg and Robinson), 794
Isoleucine synthesis by *S. typhimurium* fractions (Cronenwett and Wagner), 1643
Isozyme patterns in human LDH (Vesell), 111

JACOBSON, A. L. *See* Babich, F. R., 1299
JAIN, S. K., and R. W. ALLARD. The Nature and Stability of Equilibria under Optimizing Selection, 1436, 1804
JAOUNI, T. *See* Brimacombe, R., 954
JHON, M. S., J. GROSH, T. REE, and H. EYRING. The Significant Structure Theory Applied to Meta- and Para-Xylene, 1419
———. *See* Grosh, J., 1004
JOHNSSON, R., and A. HEGYELI. Induced Orientation of the Growth of Malignant Cells *in vitro*, 1375
JOKLIK, W. K. *See* Woodson, B., 946
JONES, D. S. *See* Söll, D., 1378
JUERGENS, W. G., F. E. STOCKDALE, Y. J. TOPPER, and J. J. ELIAS. Hormone-Dependent Differentiation of Mammary Gland *in vitro*, 629
Juvenile hormone activity of *Pyrrhocoris apterus* (Sláma and Williams), 411

KABAT, S. *See* Attardi, G., 185
Kaehler manifolds (Bishop and Goldberg), 1037
KAJI, A. *See* Kaji, H., 213
KAJI, H., and A. KAJI. Specific Binding of sRNA to Ribosomes: Effect of Streptomycin, 213
KALABA, R. *See* Bellman, R., 1293
KALMAN, R. E. Algebraic Structure of Linear Dynamical Systems, I. The Module of Σ, 1503
KAMRIN, M., W. F. BERTSCH, and R. F. WOOD. Anilides and Phenylureas: Retraction of an Earlier Calculation Which Related Pi-Electron Structure to Inhibition of Photosynthesis, 1285
KANNENBERG, L. C. *See* Omer, G. C., Jr., 657
KATZ, E. *See* Salzman, L. A., 542
KATZEN, H. M., and R. T. SCHIMKE. Multiple Forms of Hexokinase in the Rat: Tissue Distribution, Age Dependency, and Properties, 1218
KENNAN, A. L. *See* Pitot, H. C., 845
KENNEDY, E. P. *See* Fox, C. F., 891
KENNEY, F. T., and W. L. ALBRITTON. Repression of Enzyme Synthesis at the Translational Level and Its Hormonal Control, 1693
α-Ketoglutarate synthesis (Buchanan and Evans), 1212
KHORANA, H. G. *See* Söll, D., 1378
KIERAS, F. J. *See* Shipp, W. S., 207, 1470
KIHO, Y., and A. RICH. A Polycistronic Messenger RNA Associated with β-Galactosidase Induction, 1751
KIMURA, M. A Stochastic Model Concerning the Maintenance of Genetic Variability in Quantitative Characters, 731
KIRK, D. L. The Role of RNA Synthesis in the Production of Glutamine Synthetase by Developing Chick Neural Retina, 1345
KIRSCHBAUM, J. B. *See* Goldstein, A., 1669
KLOTZ, T., and L. SARIO. Existence of Complete Minimal Surfaces of Arbitrary Connectivity of Genus, 42
KNIPLING, E. B. *See* Boyer, J. S., 1044
KOERNER, J. F. *See* Short, E. C., Jr., 595
KORNACKER, M. S., and E. G. BALL. Citrate Cleavage in Adipose Tissue, 899
KORNBERG, A. *See* Falaschi, A., 1713
KOZINSKI, A. W., and T. H. LIN. Early Intracellular Events in the Replication of T4 Phage DNA, I. Complex Formation of Replicative DNA, 273
——— and P. B. KOZINSKI. Early Intracellular Events in the Replication of T4 Phage DNA, II. Partially Replicated DNA, 634
KOZINSKI, P. B. *See* Kozinski, A. W., 634
KRAVITZ, E. A., P. B. MOLINOFF, and Z. W. HALL. A Comparison of the Enzymes and Substrates of Gamma-Aminobutyric Acid Metabolism in Lobster Excitatory and Inhibitory Axons, 778
KRETCHMER, N. *See* Doell, R. G., 1268
KRUEGER, R. G. The Effect of Streptomycin on Antibody Synthesis *in vitro*, 144
KUFF, E. L. *See* Schneider, W. C., 1650

LABAR, F. E. A Procedure for Molecular Weight Measurements: Application to Chymotrypsinogen A, 31
Lactate dehydrogenase isozyme patterns (Vesell), 111
Lactobacillus 30a (Rosenthaler *et al.*), 152
LAICO, M. T. *See* Cook, G. M. W., 247
LAMAR, C., JR. *See* Pitot, H. C., 845
LANFORD, H. *See* Séchaud, J., 1333
LARK, K. G., and R. E. BIRD. Segregation of the Conserved Units of DNA in *Escherichia coli*, 1444
LARRABEE, A. R., E. G. MCDANIEL, H. A. BAKERMAN, and P. R. VAGELOS. Acyl Carrier Protein, V. Identification of 4′-Phosphopantetheine Bound to a Mammalian Fatty Acid Synthetase Preparation, 267
LAYDE, J. P. *See* Baserga, R., 745
Leaf water potentials (Boyer and Knipling), 1044
Learning, cross-species transfer of (Babich *et al.*), 1299
LECAM, L. A Remark on the Central Limit Theorem, 354
LEDER, P. *See* Brimacombe, R., 954
LEFSCHETZ, S. Planar Graphs and Related Topics, 1763

LEHMAN, I. R. *See* de Waard, A., 1241
Leucine biosynthetic enzymes, synthesis in *Neurospora* (Gross), 1538
Leukemia virus, murine (Mora and McFarland), 756
Leukemic cell reaction to wheat germ agglutinin (Aub *et al.*), 400
LEVERE, R. D., and S. GRANICK. Control of Hemoglobin Synthesis in the Cultured Chick Blastoderm by δ-Aminolevulinic Acid Synthetase: Increase in the Rate of Hemoglobin Formation with δ-Aminolevulinic Acid, 134
LEVINE, R. P. *See* Gorman, D. S., 1665
LEVINTOW, L. *See* Bishop, J. M., 1273
LEWIS, D. *See* Norton, W. L., 851
Ligand binding of hemoglobin (Benesch *et al.*), 535
LILJAS, A. *See* Fridborg, K., 513
Limit theorem, central (LeCam), 354
LIN, F. H. *See* Avers, C. J., 527
LIN, T. H. *See* Kozinski, A. W., 273
LIN, T.-Y. *See* Villemez, C. L., 1626
Linear continuous operators on summable functions (Bogdanowicz), 351
Lipid intermediate in glycopeptide synthesis (Matsuhashi *et al.*), 587
LIPMANN, F. *See* Ginoza, M. C., 294
Lipoamino acids in protein synthesis (Hendler), 1233
Lipopolysaccharide, bacterial, biosynthesis of (Weiner *et al.*), 228
Lipopolysaccharide inhibitor of DNA methyl transferase (Falaschi and Kornberg), 1713
Lipoproteins, serum, conformation of (Scanu), 1699
Liquid structure theory (Grosh *et al.*), 1004; (Jhon *et al.*), 1419
LITTAU, V. C., C. J. BURDICK, V. G. ALLFREY, and A. E. MIRSKY. The Role of Histones in the Maintenance of Chromatin Structure, 1204
LITTLE, C. C. Trends in Reported Incidence of Cancer by Age in Connecticut and in New York State (1935–1960), 1779
Liver chromatin, template activity (Dahmus and Bonner), 1370
Lobster axons, GABA in (Kravitz *et al.*), 778
Locally homogeneous tests for rare events (Bühler *et al.*), 673
LOH, P. C., and M. SOERGEL. Growth Characteristics of Reovirus Type 2: Actinomycin D and the Synthesis of Viral RNA, 857
LOHRMANN, R. *See* Söll, D., 1378
LORENTE DE NÓ, R., and V. HONRUBIA. Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, III, 82
——— and V. HONRUBIA. Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, IV, 388
——— and V. HONRUBIA. Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, V, 770
——— and V. HONRUBIA. Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, VI, 1061, 1803
——— and V. HONRUBIA. Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, VII, 1303
——— and V. HONRUBIA. Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, VIII, 1606
Loudness and brightness, cross-modality matching of (Stevens and Marks), 407
LOVENBERG, W., and B. E. SOBEL. Rubredoxin: A New Electron Transfer Protein from *Clostridium pasteurianum*, 193
LUMRY, R. *See* Biltonen, R., 1018
———. *See* Biltonen, R., 1412
———. *See* Müller, A., 1479
LUNDBERG, B. K. S. *See* Fridborg, K., 513
Lymphocyte RNA during PHA-stimulated growth (Rubin and Cooper), 469
Lymphocytes, sensitization by antigen-antibody complexes (Uhr), 1599
Lymphoid cells, polyribosomal size in (Norton *et al.*), 851

M proteins (Fox and Kennedy), 891; (Fox and Wittner), 1118
MABRY, T. J. *See* Alston, R. E., 1458
MACDUFF, G. *See* Benesch, R. E., 535
MACH, B., and P. VASSALLI. Biosynthesis of RNA in Antibody-Producing Tissues, 975
Macrophages, sensitization by antigen-antibody complexes (Uhr), 1599
MADISON, V. *See* Biltonen, R., 1018, 1412
MAGGIO, R. *See* Monroy, A., 107
MAITRA, U., and J. HURWITZ. The Role of DNA in RNA Synthesis, IX. Nucleoside Triphosphate Termini in RNA Polymerase Products, 815
Maize compounds promoting cell division (Miller), 1052
MAIZEL, J. V., JR. *See* Summers, D. F., 505
Malaria, falciparum, protection against (Brewer and Powell), 741
Malignant cells, orientation of growth of (Johnsson and Hegyeli), 1375
MALRIEU, J. P. *See* Green, J. P., 659
Mammalian cell cultures, sugar effect on (Cox and Gesner), 1571
Mammalian tissues, cell turnover in (Puck), 1797
Mammary gland, hormone-dependent differentiation of (Juergens *et al.*), 629
MANDELLI, E. F. *See* Burkholder, P. R., 437
Manifold, Riemannian: Plateau problem on (Morrey), 1029; (Hsiung), 1509
Manifolds, Kaehler (Bishop and Goldberg), 1037
Mannan protein from yeast (Brock), 1104
Mapping theorems for Banach space operators (Browder), 337
MARCUS, P. I. *See* Salb, J. M., 1353
MARKOVITZ, A., and N. ROSENBAUM. A Regulator Gene That Is Dominant on an Episome and Recessive on a Chromosome, 1084
MARKS, L. E. *See* Stevens, J. C., 407
MARKUS, G. Protein Substrate Conformation and Proteolysis, 253
———. *See* Grossberg, A. L., 942
MARLER, E., and E. A. DAVIDSON. Structure of a Polysaccharide Protein Complex, 648
MARMUR, J. *See* Dubnau, D., 491, 724
MARQUIS, N. R. *See* Fritz, I. B., 1226
Martian environment (Abelson), 1490

Martingales in linear spaces (McShane), 37
MASSIE, H. R., and B. H. ZIMM. Molecular Weight of the DNA in the Chromosomes of *E. coli* and *B. subtilis*, 1636
——— and B. H. ZIMM. The Use of Hot Phenol in Preparing DNA, 1641
MASTERS, M., and A. B. PARDEE. Sequence of Enzyme Synthesis and Gene Replication during the Cell Cycle of *Bacillus subtilis*, 64
MATSUHASHI, M., C. P. DIETRICH, and J. L. STROMINGER. Incorporation of Glycine into the Cell Wall Glycopeptide in *Staphylococcus aureus:* Role of sRNA and Lipid Intermediates, 587
MAURER, H. R. *See* Chalkley, G. R., 498
McCARTHY, B. J., and J. J. HOLLAND. Denatured DNA as a Direct Template for *in vitro* Protein Synthesis, 880
McCONNELL, H. M., B. M. HOFFMAN, D. D. THOMAS, and F. R. GAMBLE. Chemical Enhancement of Superconductivity, 371
———. *See* Stone, T. J., 1010
McDANIEL, E. G. *See* Larrabee, A. R., 267
McFARLAND, V. W. *See* Mora, P. T., 756
McGEE, Z. A., M. ROGUL, S. FALKOW, and R. G. WITTLER. The Relationship of *Mycoplasma pneumoniae* (Eaton Agent) to *Streptococcus* MG: Application of Genetic Tests to Determine Relatedness of L-Forms and PPLO to Bacteria, 457
McSHANE, E. J. A Generalization of Convexity, and Martingales in Linear Spaces, 37
McSWAIN, B. D. *See* Arnon, D. I., 927
Measurement of leaf water potentials (Boyer and Knipling), 1044
Mechanics, statistical, and irreversibility (Andrews), 13
MELLETZ, E. W. *See* Weiler, E., 1310
MELNICK, J. L. *See* Rapp, F., 717
Membrane fractions of *S. typhimurium* and isoleucine synthesis (Cronenwett and Wagner), 1643
Membrane subunits of *M. laidlawii* (Razin *et al.*), 219
Membranes, cell-free biosynthesis of glycoprotein of (Cook *et al.*), 247; (Eylar and Cook), 1678
Memory fixation in goldfish (Agranoff *et al.*), 788
MENGER, K. A Characterization of Weierstrass Analytic Functions, 1025
MERRIAM, V., and M. P. GORDON. Photoreactivation of Tobacco Mosaic Virus Ribonucleic Acid Following Near Ultraviolet Irradiation, 1261
MERRIL, C. R. *See* Snyder, S. H., 258
Message, monocistronic, translation of (Clark *et al.*), 1193
Messenger RNA: (Weissmann), 202; (Borst and Weissmann), 982; interferon-specific (Wagner and Huang), 1112; translation of in protein synthesis (Thach *et al.*), 1167; synthesis of (Goldstein *et al.*); 1669, (Hayward and Green), 1675; β-galactoside induction associated with (Kiho and Rich), 1751
Meta- and para-xylene (Jhon *et al.*), 1419
Methionine and heme peptide from cytochrome *c* (Harbury *et al.*), 1658
Methyl effects on aliphatic liquids (Hildebrand and Dymond), 1001
Methyl transferase, DNA, lipopolysaccharide inhibitor of (Falaschi and Kornberg), 1713
Mice, irradiation and mutations in (Russell), 1552
Microflora, Gunflint (Cloud and Hagen), 1
Microorganism infection and chromosome changes (Diaz and Pavan), 1321
Microsomal-bound collagen precursors (Bekhor *et al.*), 615
MILLER, A. H. Capacity for Photoperiodic Response and Endogenous Factors in the Reproductive Cycles of an Equatorial Sparrow, 97
MILLER, C. O. Evidence for the Natural Occurrence of Zeatin and Derivatives: Compounds from Maize Which Promote Cell Division, 1052
MILLER, R. C. *See* Ginoza, W., 551
MILLET, J. *See* Schaeffer, P., 704
MILLS, D. *See* Spiegelman, S., 919
Minimal surfaces of arbitrary connectivity and genus (Klotz and Sario), 42
MIRSKY, A. E. *See* Davidson, E. H., 696
———. *See* Littau, V. C., 1204
Mitochondria in nerve fibers (Weiss and Pillai), 48
Mitochondrial diversity and *S. cerevisiae* (Avers *et al.*), 527
Mitochondrial membranes and acylcarnitine esters (Fritz and Marquis), 1226
Mitochondrial rat liver DNA (Schneider and Kuff), 1650
MODERSOHN, H. *See* Stahl, F. W., 1342
MOHSENI, Z. *See* Bekhor, I. J., 615
Molecular basis of antibody formation (Dreyer and Bennett), 864
Molecular structure of M proteins (Fox and Wittner), 1118
Molecular weight measurements, procedure (LaBar), 31
MOLINOFF, P. B. *See* Kravitz, E. A., 778
Monkeys, social isolation in (Harlow *et al.*), 90
Monocistronic message, translation of (Clark *et al.*), 1193
MONROY, A., R. MAGGIO, and A. M. RINALDI. Experimentally Induced Activation of the Ribosomes of the Unfertilized Sea Urchin Egg, 107
Monsoon, southwest, Somali Current during (Stommel and Wooster), 8
MORA, P. T., and V. W. McFARLAND. The Nucleic Acid of a Murine Leukemia Virus, 756
MORELL, P. *See* Dubnau, D., 491
MOROWITZ, H. J. *See* Razin, S., 219
Morphology, cell, sugar effect on (Cox and Gesner), 1571
MORREY, C. B., JR. The Higher-Dimensional Plateau Problem on a Riemannian Manifold, 1029
MORSE, M. The Reduction of a Function Near a Nondegenerate Critical Point, 1759
MORTLOCK, R. P., D. D. FOSSITT, and W. A. WOOD. A Basis for Utilization of Unnatural Pentoses and Pentitols by *Aerobacter aerogenes*, 572

Moss, B., and V. M. INGRAM. The Repression and Induction by Thyroxin of Hemoglobin Synthesis during Amphibian Metamorphosis, 967
Mucopeptide synthesis (Wise and Park), 75
MUKHERJEE, A. *See* Plescia, O. J., 1281
MÜLLER, A., and R. LUMRY. The Relation between Prompt and Delayed Emission in Photosynthesis, 1479
Multifunctions, continuity of (Whyburn), 1494
MUNSAT, T. L. *See* Price, H. M., 1398
Murine leukemia virus (Mora and McFarland), 756
MURPHY, A. J. *See* Harbury, H. A., 1658
Muscle, sodium ion complexing in (Cope), 225
Mutagen-induced hybridization of *S. typhimurium* and *E. coli* (Eisenstark), 117
Mutation frequency in irradiated mice (Russell), 1552
Mutation, nonsense, suppression of (Engelhardt *et al.*), 1791
Mutations, nonchromosomal, in *C. reinhardi* (Gillham), 1560
Mycoplasma laidlawii, membrane subunits of (Razin *et al.*), 219
Mycoplasma pneumoniae and *Streptococcus* MG (McGee *et al.*), 457
Myelinated nerve fibers (Lorente de Nó and Honrubia), 82, 388, 770, 1061, 1303, 1606, 1803
MYER, Y. P., and H. A. HARBURY. Optical Rotatory Dispersion of Cytochrome *c*, 1391
———. *See* Harbury, H. A., 1658
Myopathy, nemaline (Price *et al.*), 1398

NAGAI, Y. *See* Gross, J., 1197
NAIFEH, K. *See* Alston, R. E., 1458
NAKAJIMA, H. *See* Allen, R. D., 1153
NARUSE, H. *See* Waelsch, H., 1249
NATIONAL ACADEMY OF SCIENCES. Organization: Officers, Council, Members, Foreign Associates, and Sections, 295
Nemaline myopathy (Price *et al.*), 1398
Nerve fibers, action currents in (Lorente de Nó and Honrubia), 82, 388, 770, 1061, 1303, 1606, 1803
Nerve fibers, axonal flow in (Weiss and Pillai), 48; (Taylor and Weiss), 1521
Nervous system, CO_2 fixation in (Waelsch *et al.*), 1249
Neurospora (Gross), 1538
Neurospora crassa, tryptophan pathway of (DeMoss and Wegman), 241; (Heller and Smith), 1621
New York (Little), 1779
Newcastle disease virus, nucleic acid of (Duesberg and Robinson), 794
NEWTON, J. *See* Séchaud, J., 1333
NEYMAN, J. *See* Bühler, W., 673
NILSON, E. N. *See* Ahlberg, J. H., 344
NIMNI, M. E. *See* Bekhor, I. J., 615
NIRENBERG, M. *See* Brimacombe, R., 954
NISHIMURA, S. *See* Söll, D., 1378
Nitro reductase (Adamson *et al.*), 1386
Noetherian rings (Small), 1035; (Herstein), 1036
Nogalamycin interaction with DNA (Bhuyan and Smith), 566
Nonchromosomal mutations in *C. reinhardi* (Gillham), 1560
Nonlinear operators in Banach spaces (Browder), 337, 1041
Nonsense mutation suppression (Engelhardt *et al.*), 1791
NORDIO, P. L. *See* Stone, T. J., 1010
NORTHROP, J. H. Production of a New Bacterial Virus by Prolonged Growth of Lysogenic *E. coli* Cultures in the Presence of Triethylene Melamine, 1632
NORTON, W. L., D. LEWIS, and M. ZIFF. The Effect of Progressive Immunization on Polyribosomal Size in Lymphoid Cells, 851
Nuclear magnetic resonance evidence for sodium ion complexing in muscle (Cope), 225
Nucleic acid: of Bryan strain of RSV (Robinson *et al.*), 137, (Baluda and Robinson), 1686; of murine leukemia virus (Mora and McFarland), 756; of Newcastle disease virus (Duesberg and Robinson), 794
Nucleic acid base sequence homologies (Dubnau *et al.*), 491
Nucleic-acid bases, hydrogen atom bombardment of (Herak and Gordy), 1287
Nucleic acid synthesis, cell-free (Spiegelman *et al.*), 919
Nucleohistone: and histone-bound RNA (Huang and Bonner), 960; as primer for RNA synthesis (Sonnenberg and Zubay), 415
Nucleoprotein complex in protein synthesis (Wang), 800
Nucleoside triphosphate termini in RNA polymerase (Maitra and Hurwitz), 815
Nucleotide sequences of RNA codons (Brimacombe *et al.*), 954
Numerical solutions of partial differential integral equations (Bellman and Kalaba), 1293

O'DONOVAN, G. A., and J. L. INGRAHAM. Cold-Sensitive Mutants of *Escherichia coli* Resulting from Increased Feedback Inhibition, 451
OHTSUKA, E. *See* Söll, D., 1378
OISHI, M., and N. SUEOKA. Location of Genetic Loci of Ribosomal RNA on *Bacillus subtilis* Chromosome, 483
OLSON, J. A., and O. HAYAISHI. The Enzymatic Cleavage of β-Carotene into Vitamin A by Soluble Enzymes of Rat Liver and Intestine, 1364
OMER, G. C., JR., S. G. STARRFIELD, and L. C. KANNENBERG. Structured Cosmological Models, 657
Oncogenesis in hamsters: induction of (Huebner *et al.*), 381; prevention of (Girardi), 445
Operator constitutive strains of *E. coli* (Steers *et al.*), 1174
Operators, nonlinear, in Banach space (Browder), 337, 1041
Optical rotatory dispersion of: α-chymotrypsin (Biltonen *et al.*), 1018; cytochrome *c* (Myer and Harbury), 1391
Optimizing selection (Jain and Allard), 1436, 1804

Organismic concepts in biological theory (Elsasser), 1431
ORGEL, L. E. *See* Beck, A., 664
OSBORN, M. J. *See* Weiner, I. M., 228
Oscillations of the earth (Dorman *et al.*), 364
OXELFELT, P. *See* Fridborg, K., 513
Oxoproline and hydroxyproline synthesis (Salzman *et al.*), 542
Oxygenation of hemoglobin (Benesch *et al.*), 535
Oxytocin inactivation by acetone (Yamashiro *et al.*), 166

PALCZUK, N. C. *See* Plescia, O. J., 1281
PALMER, E. *See* Harary, F., 680
Paramyosin solutions, viscoelastic behavior of (Allis and Ferry), 369
Parathyroid hormone activity (Potts *et al.*), 1743
PARDEE, A. B. *See* Masters, M., 64
PARK, J. T. *See* Wise, E. M., Jr., 75
PARKER, H. *See* Biltonen, R., 1018
———. *See* Biltonen, R., 1412
PAUL, A. V. *See* de Waard, A., 1241
PAULING, C., and P. HANAWALT. Nonconservative DNA Replication in Bacteria after Thymine Starvation, 1728
PAULING, L. The Close-Packed-Spheron Model of Atomic Nuclei and Its Relation to the Shell Model, 989
PAVAN, C. *See* Diaz, M., 1321
PEARSON, C. M. *See* Price, H. M., 1398
Pectin, biosynthesis of (Villemez *et al.*), 1626
Penicillin in cell wall synthesis (Wise and Park), 75
Penicillins, action mechanism of (Tipper and Strominger), 1133
Pentose and pentitol utilization by *A. aerogenes* (Mortlock *et al.*), 572
Pepsin inactivation by diphenyldiazomethane (Delpierre and Fruton), 1161
Peptides, tryptic, from antibody molecules (Doolittle and Singer), 1773
PERAINO, C. *See* Pitot, H. C., 845
Perceptual span variability (Estes), 403
Perhydrotriphenylene inclusion compounds, ESR of free radicals in (Griffith), 1296
Periodic pulsations of RNA synthesis (Rudner *et al.*), 904
Permutation groups (Harary and Palmer), 680
Perodicticus potto, feeding habit of (Cowgill), 420
PETERSEN, R. O. *See* Baserga, R., 745
———. *See* Baserga, R., 1141
Phage P22 transduction of *E. coli* genetic material (Eisenstark), 1557
Phage SP3 infection of *B. subtilis* (Trilling and Aposhian), 622
Phage T2 infection and deoxyribonucleotidases (Short and Koerner), 595
Phage T4: in enzymatic phosphorylation (Richardson), 158; chromosome structure in (Séchaud *et al.*), 1333; heterozygotes in (Shalitin and Stahl), 1340, (Stahl *et al.*), 1342; as inhibitor of *E. coli* and λ mRNA synthesis (Hayward and Green), 1675
Phage T4 and T5, DNA polymerase in (de Waard *et al.*), 1241
Phage T4 DNA, replication of (Kozinski and Lin), 273; (Kozinski and Kozinski), 634
Phage T7 inactivation by X rays (Freifelder), 128
Phaseolus aureus (Villemez *et al.*), 1626
Phenazine methosulfate, free radicals from (White and Dearman), 887
Phenol in DNA preparation (Massie and Zimm), 1641
Phenylureas and anilides (Kamrin *et al.*), 1285
PHILIPSON, L. *See* Fridborg, K., 513
Phosphate formation in aqueous solution (Beck and Orgel), 664
4′-Phosphopantetheine in fatty acid synthetase (Larrabee *et al.*), 267
Phosphorylated intermediate in "transport ATPase" (Hokin *et al.*), 177
Phosphorylation and chloroplast fluorescence (Arnon *et al.*), 927
Phosphorylation of nucleic acid by enzyme (Richardson), 158
Photoperiodism in equatorial sparrow (Miller), 97
Photoreactivation of TMV-RNA (Merriam and Gordon), 1261
Photosynthesis, inhibition of, in anilides and phenylureas (Kamrin *et al.*), 1285; (Müller and Lumry), 1479
Photosynthetic bacterium in α-ketoglutarate synthesis (Buchanan and Evans), 1212
Photosynthetic electron transport (Gorman and Levine), 1665
Photosynthetic phosphorylation and chloroplast fluorescence (Arnon *et al.*), 927
Phytohemagglutinin and lymphocyte RNA (Rubin and Cooper), 469
Phytoplankton carbon assimilation (Burkholder and Mandelli), 437
PICKERING, W. H. Some New Methods for Planetary Exploration, 1471
PILLAI, A. *See* Weiss, P., 48
PIÑA, M., and M. GREEN. Biochemical Studies on Adenovirus Multiplication, IX. Chemical and Base Composition Analysis of 28 Human Adenoviruses, 547
PINTO-DANTAS, C. A. *See* Csapo, A. I., 1069
PITKANEN, A. *See* Robinson, W. S., 137
PITOT, H. C., C. PERAINO, C. LAMAR, JR., and A. L. KENNAN. Template Stability of Some Enzymes in Rat Liver and Hepatoma, 845
Planar graphs (Lefschetz), 1763
Planetary exploration (Pickering), 1471
Plastids, sieve element, in *Beta* (Esau), 429
Plastocyanin and cytochrome *f* (Gorman and Levine), 1665
Plateau problem on Riemannian manifold (Morrey), 1029
Pleistocene fossil bones, proteinaceous residues in (Ho), 26
PLESCIA, O. J., N. C. PALCZUK, E. CORA-FIGUEROA, A. MUKHERJEE, and W. BRAUN. Production of Antibodies to Soluble RNA (sRNA), 1281
Pneumococcus, streptomycin-resistance markers in (Rotheim and Ravin), 1327
Poliovirus-infected HeLa cells: noncapsid proteins in (Summers *et al.*), 505; RNA from (Bishop *et al.*), 1273
Polycistronic mRNA and β-galactoside induction (Kiho and Rich), 1751
Polygalacturonic acid chain of pectin (Villemez *et al.*), 1626

Polymerase, DNA, in T4 and T5 (de Waard *et al.*), 1241
Polynucleotides: and aminoacyl-sRNA binding (Söll *et al.*), 1378; synthetic, in release of polypeptide chains (Takanami and Yan), 1450
Polyoma virus: inactivation by, of irradiation (Benjamin), 121, (Basilico and di Mayorca), 125; in DNA synthesis (Gershon *et al.*), 1584
Polyribonucleotide alkylation (Abell *et al.*), 608
Polyribosomal size in lymphoid cells (Norton *et al.*), 851
Polyribosomes: of maturing reticulocytes (Danon *et al.*), 873; rat liver (Wilson and Hoagland), 600
Polysaccharide protein complex (Marler and Davidson), 648
Polyuridylic acid, alkylated (Abell *et al.*), 608
POTTS, J. T., JR., G. D. AURBACH, L. M. SHERWOOD, and A. SANDOVAL. Structural Basis of Biological and Immunological Activity of Parathyroid Hormone, 1743
POWELL, R. D. *See* Brewer, G. J., 741
Power group of two permutation groups (Harary and Palmer), 680
Precambrian shale, biogenic steranes and triterpanes in (Burlingame *et al.*), 1406
PRESSMAN, D. *See* Grossberg, A. L., 942
PRICE, H. M., G. B. GORDON, C. M. PEARSON, T. L. MUNSAT, and J. M. BLUMBERG. New Evidence for Excessive Accumulation of Z-Band Material in Nemaline Myopathy, 1398
Proflavine interaction with α-chymotrypsin and trypsin (Glazer), 171
Progesterone effect on human uterus (Csapo and Pinto-Dantas), 1069
Protein complex, polysaccharide (Marler and Davidson), 648
Protein-heme interactions in cytochrome *c* (Urry), 640
Protein residues in Pleistocene fossils (Ho), 26
Protein(s): electron transfer (Lovenberg and Sobel), 193; C-reactive (Gotschlich and Edelman), 558; *M* (Fox and Kennedy), 891, (Fox and Wittner), 1118
Protein substrate conformation (Markus), 253
Protein synthesis: by cell-free systems (Ganoza *et al.*), 294; DNA as template for (McCarthy and Holland), 880; messenger translation in (Thach *et al.*), 1167; lipoamino acids as precursors in (Hendler), 1233; nucleoprotein complex in (Wang), 800; and ribosomal RNA (Ecker), 1465
Proteolysis and protein substrate conformation (Markus), 253
Proton magnetic resonance study of thiamine and indole (Sable and Biaglow), 808
Protoplasts from *Avena* coleoptile (Ruesink and Thimann), 56
Pseudomonas testosteroni: oxidation of steroids by (Shaw *et al.*), 837; enzyme induction in (Welch), 1359
Pseudopod extension in *C. carolinensis* (Allen *et al.*), 1153
Psychrometer measurement of leaf water potentials (Boyer and Knipling), 1044
PUCK, T. T. Cell Turnover in Mammalian Tissues: Use of Cell Depletion Measurements to Calculate X-Ray Reproductive Survival Curves *in vivo*, 1797
Pulsations of RNA synthesis (Rudner *et al.*), 904
PURI, P. S. *See* Bühler, W., 673
Puromycin inhibition of interferon synthesis (Wagner and Huang), 1112
Pyrrhocoris apterus, hormone activity of (Sláma and Williams), 411
Pyruvic kinase, univalent cation effects on (Sorger *et al.*), 1614

Quail, castrated, mating in (Beach and Inman), 1426
Quantum corrections to equation of state (Henderson and Davison), 21; (Chen *et al.*), 1514

Rabbit embryo skin, collagen precursors in (Bekhor *et al.*), 615
Radiation target size of lytic ability of polyoma virus (Basilico and di Mayorca), 125
RALL, D. P. *See* Adamson, R. H., 1386
RAMSEUR, M. R. *See* Abell, C. W., 608
Rana pipiens, primordial germ cells in (Smith), 101
RANCOURT, M. W. *See* Avers, C. J., 527
RAPP, F., J. S. BUTEL, and J. L. MELNICK. SV40-Adenovirus "Hybrid" Populations: Transfer of SV40 Determinants from One Type of Adenovirus to Another, 717
Rat, hexokinases in (Katzen and Schimke), 1218
Rat liver: cell-free system of (Ganoza *et al.*), 294; polyribosomes of (Wilson and Hoagland), 600; stability of templates in (Pitot *et al.*), 845; enzyme cleavage by (Olson and Hayaishi), 1364; mitochondrial DNA of (Schneider and Kuff), 1650
Rats, learning affected by hamster RNA (Babich *et al.*), 1299
RAVIN, A. W. *See* Rotheim, M. B., 1327
RAZIN, S., H. J. MOROWITZ, and T. M. TERRY. Membrane Subunits of *Mycoplasma laidlawii* and Their Assembly to Membrane-like Structures, 219
Red shift discretization in the epochal cosmology (Thomas), 994
REE, T. *See* Grosh, J., 1004
———. *See* Jhon, M. S., 1419
REICHARD, P. *See* Holmgren, A., 830
REICHMANN, M. E. *See* Clark, J. M., Jr., 1193
REINHOLD, H. *See* Séchaud, J., 1333
REJMAN, E. *See* Rudner, R., 904
Reovirus growth characteristics (Loh and Soergel), 857
Reovirus replication (Dales), 462
Reovirus RNA as template for *E. coli* polymerases (Shatkin), 1721
Replicases, RNA (Haruna and Spiegelman), 579, 1189
Replication, cell-free, of nucleic acid (Spiegelman *et al.*), 919
Replication of: viral RNA (Weissmann), 202, (Borst and Weissmann), 982; vaccinia and reovirus (Dales), 462; T4 phage DNA (Kozinski and Lin), 273,

(Kozinski and Kozinski), 634; DNA after thymine starvation (Pauling and Hanawalt), 1728
Repression and derepression in *S. typhimurium* (Goldberger and Berberich), 279
Repression of enzyme synthesis by hormones (Kenney and Albritton), 1693
Repression of hemoglobin synthesis by thyroxin (Moss and Ingram), 967
Repression of sporulation (Schaeffer *et al.*), 704
Reproductive cycles of equatorial sparrow (Miller), 97
Reticulocyte polyribosomes (Danon *et al.*), 873
Retina, glutamine synthetase production by (Kirk), 1345
Retine (Együd), 200
RF-DNA, inactivation of (Ginoza and Miller), 551
Ribonucleotide reductase requirement for cobamide coenzyme (Beck and Hardy), 286
Ribosomal RNA: sites in DNA of (Attardi *et al.*), 185; location of genetic loci for (Oishi and Sueoka), 483; in ribosomal protein synthesis (Ecker), 1465
Ribosome activation in unfertilized sea urchin egg (Monroy *et al.*), 107
Ribosome distribution in rat liver (Wilson and Hoagland), 600
Ribosomes: sRNA binding to (Kaji and Kaji), 213; in streptomycin-activated suppression (Anderson *et al.*), 1076; of *E. coli* treated with 5-fluorouracil (Andoh and Chargaff), 1181; release of polypeptides from (Takanami and Yan), 1450
RICH, A. *See* Kiho, Y., 1751
RICHARDSON, C. C. Phosphorylation of Nucleic Acid by an Enzyme from T4 Bacteriophage-Infected *Escherichia coli*, 158
RIEFFEL, M. A. A General Wedderburn Theorem, 1513
Riemannian manifold: and Plateau problem (Morrey), 1029; transformations of (Hsiung), 1509
Rigidity of Kaehler manifolds (Bishop and Goldberg), 1037
RINALDI, A. M. *See* Monroy, A., 107
Rings of continuous functions (Watts), 1027
Rings, Noetherian (Small), 1035; (Herstein), 1036
RNA: of Rous sarcoma virus (Robinson *et al.*), 137, (Robinson and Baluda), 1686; metabolism of in PHA-stimulated lymphocytes (Rubin and Cooper), 469; role of in estrogen action (Segal *et al.*), 782; histone-bound (Huang and Bonner), 960; in antibody-producing tissues (Mach and Vassalli), 975; photoreactivation of TMV- (Merriam and Gordon), 1261; RNase-resistant, from HeLa cells (Bishop *et al.*), 1273; hamster, effect on rat behavior of (Babich *et al.*), 1299; chromosomal origin of transfer (Woods and Zubay), 1705; reovirus, as template for *E. coli* polymerases (Shatkin), 1721
RNA codewords and protein synthesis (Brimacombe *et al.*), 954
RNA-DNA complex in genetic transcription (Hayashi), 1736
RNA, messenger: (Weissmann), 202, (Borst and Weissmann), 982; interferon-specific (Wagner and Huang), 1112; translation of in protein synthesis (Thach *et al.*), 1167; synthesis of (Goldstein *et al.*), 1669, (Hayward and Green), 1675; β-galactoside induction associated with (Kiho and Rich), 1751
RNA polymerase, chloroquine inhibition of (Cohen and Yielding), 521
RNA replicase (Haruna and Spiegelman), 579; (Spiegelman *et al.*), 919; (Haruna and Spiegelman), 1189
RNA, ribosomal: sites in DNA of (Attardi *et al.*), 185; genetic loci for (Oishi and Sueoka), 483; in protein synthesis (Ecker), 1465
RNA synthesis: nucleohistone in (Sonnenberg and Zubay), 415; genes in (Dubnau *et al.*), 724; DNA role in (Maitra and Hurwitz), 815; pulsation of (Rudner *et al.*), 904; in production of glutamine synthetase (Kirk), 1345; viral inhibition of cellular (Huang and Wagner), 1579
RNA, viral: replication of (Weissmann), 202, (Borst and Weissmann), 982; and actinomycin D (Loh and Soergel), 857
ROBBINS, P. W. *See* Wright, A., 235
ROBINSON, H. C. *See* Telser, A., 912
ROBINSON, W. S., A. PITKANEN, and H. RUBIN. The Nucleic Acid of the Bryan Strain of Rous Sarcoma Virus: Purification of the Virus and Isolation of the Nucleic Acid, 137
——— and M. A. BALUDA. The Nucleic Acid from Avian Myeloblastosis Virus Compared with the RNA from the Bryan Strain of Rous Sarcoma Virus, 1686
———. *See* Duesberg, P. H., 794
ROGUL, M. *See* McGee, Z. A., 457
ROMAN, A. *See* Goldstein, A., 1669
ROSEN, G. *See* Doell, R. G., 1268
ROSENBAUM, N. *See* Markovitz, A., 1084
ROSENTHALER, J., B. M. GUIRARD, G. W. CHANG, and E. E. SNELL. Purification and Properties of Histidine Decarboxylase from *Lactobacillus* 30a, 152
ROSINI, L. A. *See* Abell, C. W., 608
RÖSLER, H. *See* Alston, R. E., 1458
ROTHEIM, M. B., and A. W. RAVIN. Low Frequency of Co-Integration of Two Linked Streptomycin-Resistance Markers in Pneumococcus, 1327
ROTHFIELD, L. *See* Weiner, I. M., 228
Rous sarcoma virus RNA (Robinson *et al.*), 137; (Robinson and Baluda), 1686
ROWE, W. P. Studies of Adenovirus-SV40 Hybrid Viruses, III. Transfer of SV40 Gene between Adenovirus Types, 711
———. *See* Black, P. H., 1126
Rubiflavin, free radicals from (White and Dearman), 887
RUBIN, A. D., and H. L. COOPER. Evolving Patterns of RNA Metabolism during Transition from Resting State to Active Growth in Lymphocytes Stimulated by Phytohemagglutinin, 469
RUBIN, H. *See* Robinson, W. S., 137
Rubredoxin (Lovenberg and Sobel), 193
RUDNER, R., E. REJMAN, and E. CHARGAFF. Genetic Implications of Periodic Pulsations of the Rate of Synthesis and the Com-

position of Rapidly Labeled Bacterial RNA, 904
RUESINK, A. W., and K. V. THIMANN. Protoplasts from the *Avena* Coleoptile, 56
RUSSELL, W. L. Effect of the Interval between Irradiation and Conception on Mutation Frequency in Female Mice, 1552

SABLE, H. Z., and J. E. BIAGLOW. Coenzyme Interactions: Proton Magnetic Resonance Study of Molecular Complexes of Thiamine and Indole Derivatives, 808
Saccharomyces cerevisiae, mitochondrial diversity in (Avers *et al.*), 527
SACHS, L. *See* Gershon, D., 1584
SALB, J. M., and P. I. MARCUS. Translational Inhibition of Mitotic HeLa Cells, 1353
Salmonella typhimurium: O-antigen groups of (Weiner *et al.*), 228, (Wright *et al.*), 235; (Goldberger and Berberich), 279; (Berberich and Gots), 1254; (Cronenwett and Wagner), 1643
Salmonella typhimurium × *E. coli* hybrids (Eisenstark), 117, 1557
SALTMARSH-ANDREW, M. *See* Weiner, I. M., 228
SALZMAN, L. A., H. WEISSBACH, and E. KATZ. Conversion of C^{14}- and Cis- or Trans-4-H^3-L-Proline to 4-Hydroxy-L-Proline and 4-Oxo-L-Proline by *Streptomyces antibioticus*, 542
SANDOVAL, A. *See* Potts, J. T., Jr., 1743
SANFORD, B. H. *See* Aub, J. C., 396
———. *See* Aub, J. C., 400
SARIO, L. *See* Klotz, T., 42
SARTORELLI, A. C. *See* Booth, B. A., 1803
SASTRY, P. S. *See* Hokin, L. E., 177
Satellite TNV-RNA (Fridborg *et al.*), 513; (Clark *et al.*), 1193
SCANU, A. Studies on the Conformation of Human Serum High-Density Lipoproteins HDL_2 and HDL_3, 1699
Scattering, large-angle (Serber), 692
SCHAEFFER, P., J. MILLET, and J.-P. AUBERT. Catabolic Repression of Bacterial Sporulation, 704
SCHELL, K. *See* Huebner, R. J., 381
SCHIMKE, R. T. *See* Katzen, H. M., 1218
SCHNEIDER, W. C., and E. L. KUFF. The Isolation and Some Properties of Rat Liver Mitochondrial Deoxyribonucleic Acid, 1650
Sea urchin egg (Monroy *et al.*), 107
SÉCHAUD, J., G. STREISINGER, J. EMRICH, J. NEWTON, H. LANFORD, H. REINHOLD, and M. M. STAHL. Chromosome Structure in Phage T4, II. Terminal Redundancy and Heterozygosis, 1333
SEGAL, S. J., O. W. DAVIDSON, and K. WADA. Role of RNA in the Regulatory Action of Estrogen, 782
Selection, optimizing, equilibria under (Jain and Allard), 1436, 1804
Sensitization of lymphocytes and macrophages (Uhr), 1599
Sensory coding in electric fish electroreceptors (Bullock and Chichibu), 422
SERBER, R. Shadow Scattering at Large Angles, 692
Serum high-density lipoproteins (Scanu), 1699
Sets, directed families of (Whyburn), 688
Sex-specific mannan protein from yeast (Brock), 1104
SHALITIN, C., and F. W. STAHL. Additional Evidence for Two Kinds of Heterozygotes in Phage T4, 1340
SHATKIN, A. J. Inactivity of Purified Reovirus RNA as a Template for *E. coli* Polymerases *in vitro*, 1721
SHAW, D. A., L. F. BORKENHAGEN, and P. TALALAY. Enzymatic Oxidation of Steroids by Cell-Free Extracts of *Pseudomonas testosteroni:* Isolation of Cleavage Products of Ring A, 837
Shell and spheron models of atomic nuclei (Pauling), 989
SHERWOOD, L. M. *See* Potts, J. T., Jr., 1743
SHIPP, W. S., F. J. KIERAS, and R. HASELKORN. DNA Associated with Tobacco Chloroplasts, 207, 1470
SHORT, E. C., JR., and J. F. KOERNER. Separation of Deoxyribo-oligonucleotidases Induced by Infection with Bacteriophage T2, 595
Sieve element plastids in *Beta* (Esau), 429
SINGER, I. *See* Tasaki, I., 763
SINGER, S. J. *See* Doolittle, R. F., 1773
SLÁMA, K., and C. M. WILLIAMS. Juvenile Hormone Activity for the Bug *Pyrrhocoris apterus*, 411
SMALL, L. W. An Example in Noetherian Rings, 1035
SMITH, C. G. *See* Bhuyan, B. K., 566
SMITH, E. L. *See* Heller, J., 1621
SMITH, I. *See* Dubnau, D., 491
———. *See* Dubnau, D., 724
SMITH, L. D. Transplantation of the Nuclei of Primordial Germ Cells into Enucleated Eggs of *Rana pipiens*, 101
SNELL, E. E. *See* Rosenthaler, J., 152
SNYDER, S. H., and C. R. MERRIL. A Relationship between the Hallucinogenic Activity of Drugs and Their Electronic Configuration, 258
SOBEL, B. E. *See* Lovenberg, W., 193
Social isolation in monkeys (Harlow *et al.*), 90
Sodium ion complexing in muscle (Cope), 225
SOERGEL, M. *See* Loh, P. C., 857
SÖLL, D., E. OHTSUKA, D. S. JONES, R. LOHRMANN, H. HAYATSU, S. NISHIMURA, and H. G. KHORANA. Studies on Polynucleotides, XLIX. Stimulation of the Binding of Aminoacyl-sRNA's to Ribosomes by Ribotrinucleotides and a Survey of Codon Assignments for 20 Amino Acids, 1378
Somali current during southwest monsoon (Stommel and Wooster), 8
SONNENBERG, B. P., and G. ZUBAY. Nucleohistone as a Primer for RNA Synthesis, 415
SORGER, G. J., R. E. FORD, and H. J. EVANS. Effects of Univalent Cations on the Immunoelectrophoretic Behavior of Pyruvic Kinase, 1614
Sound velocity and volume compression (Anderson), 667
Sparrow, equatorial, reproductive cycles of (Miller), 97
Spheron model of atomic nuclei (Pauling), 989
SPIEGELMAN, S., I. HARUNA, I. B. HOLLAND, G. BEAUDREAU, and D. MILLS. The Synthesis of a Self-Propagating and Infec-

tious Nucleic Acid with a Purified Enzyme, 919
———. *See* Haruna, I., 579
———. *See* Haruna, I., 1189
———. *See* Clark, J. M., Jr., 1193
Spin-labeled biomolecules (Stone *et al.*), 1010
Spin-labeled hapten (Stryer and Griffith), 1785
Splines, generalized, convergence properties of (Ahlberg *et al.*), 344
Sporulation, repression of (Schaeffer *et al.*), 704
Squid giant axons, excitation of (Tasaki *et al.*), 763
sRNA: specific binding of, with template-ribosome complex (Kaji and Kaji), 213; in glycopeptide synthesis (Matsuhashi *et al.*), 587; antibodies to (Plescia *et al.*), 1281
Stability of systems over finite intervals (Weiss and Infante), 44
STAHL, F. W., H. MODERSOHN, B. E. TERZAGHI, and J. M. CRASEMANN. The Genetic Structure of Complementation Heterozygotes, 1342
———. *See* Shalitin, C., 1340
STAHL, M. M. *See* Séchaud, J., 1333
Staphylococcus aureus (Matsuhashi *et al.*), 587
STARRFIELD, S. G. *See* Omer, G. C., Jr., 657
Stars, limiting mass of rotating white dwarf (Anand), 23
Statistical mechanics and irreversibility (Andrews), 13
STEERS, E., JR., G. R. CRAVEN, and C. B. ANFINSEN. Comparison of β-Galactosidases from Normal ($i^-o^+z^+$) and Operator Constitutive ($i^-o^cz^+$) Strains of *E. coli*, 1174
Steranes and triterpanes in shale (Burlingame *et al.*), 1406
Sterility, hybrid, in *D. paulistorum* (Ehrman and Williamson), 481
Steroid oxidation by extracts of *P. testosteroni* (Shaw *et al.*), 837
STEVENS, J. C., and L. E. MARKS. Cross-Modality Matching of Brightness and Loudness, 407
STOCKDALE, F. E. *See* Juergens, W. G., 629
Stokes' theorem on real analytic varieties (Bungart), 343
STOMMEL, H., and W. S. WOOSTER. Reconnaissance of the Somali Current during the Southwest Monsoon, 8
STONE, T. J., T. BUCKMAN, P. L. NORDIO, and H. M. MCCONNELL. Spin-Labeled Biomolecules, 1010
STRANDBERG, B. *See* Fridborg, K., 513
STREISINGER, G. *See* Séchaud, J., 1333
Streptococci, M proteins of (Fox and Wittner), 1118
Streptococcus MG and *Mycoplasma pneumoniae* (McGee *et al.*), 457
Streptomyces antibioticus, hydroxyproline synthesis by (Salzman *et al.*), 542
Streptomycin-activated suppression (Anderson *et al.*), 1076
Streptomycin effect on: antibody synthesis (Krueger), 144; sRNA binding (Kaji and Kaji), 213
Streptomycin-resistance markers in pneumococcus (Rotheim and Ravin), 1327
Streptonigrin, free radicals from (White and Dearman), 887
Streptovitacin A in virus replication (Dales), 462
STROMINGER, J. L. *See* Matsuhashi, M., 587
———. *See* Tipper, D. J., 1133
STRYER, L., and O. H. GRIFFITH. A Spin-Labeled Hapten, 1785
Succinate and CO_2 in α-ketoglutarate synthesis (Buchanan and Evans), 1212
SUEOKA, N. *See* Oishi, M., 483
Sugars and cell morphology (Cox and Gesner), 1571
SUMMERS, D. F., J. V. MAIZEL, JR., and J. E. DARNELL, JR. Evidence for Virus-Specific Noncapsid Proteins in Poliovirus-Infected HeLa Cells, 505
———. *See* Bishop, J. M., 1273
SUNDARARAJAN, T. A. *See* Thach, R. E., 1167
Superconductivity, enhancement of (McConnell *et al.*), 371
Suppression of a nonsense mutation (Engelhardt *et al.*,) 1791
Survival curve calculation by cell depletion measurements (Puck), 1797
SV40-adenovirus hybrids (Rowe), 711; (Rapp *et al.*), 717; (Easton and Hiatt), 1100
SV40 DNA and BHK-21 cells (Black and Rowe), 1126
SV40 transformation of animal cells (Todaro and Baron), 752; (Diamandopoulos and Enders), 1092
SV40 virus oncogenesis in hamsters (Girardi), 445
Systems, dynamical (Kalman), 1503

Tadpole collagenolytic enzyme (Gross and Nagai), 1197
TAKANAMI, M., and Y. YAN. The Release of Polypeptide Chains from Ribosomes in Cell-Free Amino Acid-Incorporating Systems by Specific Combinations of Bases in Synthetic Polyribonucleotides, 1450
TAL, C. The Nature of the Cell Membrane Receptor for the Agglutination Factor Present in the Sera of Tumor Patients and Pregnant Women, 1318
TALALAY, P. *See* Shaw, D. A., 837
TASAKI, I., I. SINGER, and A. WATANABE. Excitation of Internally Perfused Squid Giant Axons in Sodium-Free Media, 763
TAYLOR, A. C., and P. WEISS. Demonstration of Axonal Flow by the Movement of Tritium-Labeled Protein in Mature Optic Nerve Fibers, 1521
TELSER, A., H. C. ROBINSON, and A. DORFMAN. The Biosynthesis of Chondroitin-Sulfate Protein Complex, 912
Temperature regulation of hibernating periods (Twente and Twente), 1058
Template activity of liver chromatin (Dahmus and Bonner), 1370
Template-bound histone (Chalkley and Maurer), 498
Template for RNA replicases (Haruna and Spiegelman), 579
Template stability of enzymes (Pitot *et al.*), 845
TERRY, T. M. *See* Razin, S., 219
TERZAGHI, B. E. *See* Stahl, F. W., 1342
THACH, R. E., M. A. CECERE, T. A. SUNDARARAJAN, and P. DOTY. The Polarity of

Messenger Translation in Protein Synthesis, 1167
THELANDER, L. *See* Holmgren, A., 830
Thiamine (Sable and Biaglow), 808
THIMANN, K. V. *See* Ruesink, A. W., 56
THOMAS, D. D. *See* McConnell, H. M., 371
THOMAS, E. On Cross Sections to Fiber Spaces, 40
THOMAS, T. Y. Red Shift Discretization in the Epochal Cosmology, 994
Thymine reaction with hydrogen (Heller and Cole), 1486
Thymine starvation and DNA replication (Pauling and Hanawalt), 1728
Thyroxin, effects on hemoglobin synthesis (Moss and Ingram), 967
TIPPER, D. J., and J. L. STROMINGER. Mechanism of Action of Penicillins: A Proposal Based on Their Structural Similarity to Acyl-D-Alanyl-D-Alanine, 1133
Tobacco chloroplasts and DNA (Shipp *et al.*), 207, 1470
Tobacco mosaic virus RNA photoreactivation (Merriam and Gordon), 1261
Tobacco necrosis virus, satellite (Fridborg *et al.*), 513; (Clark *et al.*), 1193
TODARO, G. J., and S. BARON. The Role of Interferon in the Inhibition of SV40 Transformation of Mouse Cell Line 3T3, 752
———. *See* Black, P. H., 374
TOOHEY, J. I. A Vitamin B_{12} Compound Containing No Cobalt, 934
TOPPER, Y. J. *See* Juergens, W. G., 629
Transduction by phage P22 (Eisenstark), 1557
Transfer RNA, chromosomal origin of (Woods and Zubay), 1705
Transformation, inhibition by interferon (Todaro and Baron), 752
Transformation of animal cells by virus (Black and Todaro), 374; (Diamandopoulos and Enders), 1092
Transforming and reproductive abilities of polyoma virus (Benjamin), 121; (Basilico and di Mayorca), 125
Transplantation of germ cell nuclei (Smith), 101
Transport, β-galactoside (Fox and Kennedy), 891
Transport of solutes by crown-gall tumor (Wood and Braun), 1532
Transport theory, equations of (Bellman and Kalaba), 1293
Triethylene melamine in virus production (Northrop), 1632
TRILLING, D. M., and H. V. APOSHIAN. A Deoxyribonuclease Found after Infection of *Bacillus subtilis* with Phage SP3, 622
TRUPIN, J. *See* Brimacombe, R., 954
Trypsin and α-chymotrypsin interaction with proflavine (Glazer), 171
Tryptic peptides from antibody molecules (Doolittle and Singer), 1773
Tryptophan pathway of *N. crassa* (DeMoss and Wegman), 241
TSUJIMOTO, H. Y. *See* Arnon, D. I., 927
Tumor cells: reactivity to wheat germ agglutinin (Aub *et al.*), 396; crown-gall (Wood and Braun), 1532
Tumor resistance in hamsters (Girardi), 445
Tumors, hamster, induced by type 3 adenovirus (Huebner *et al.*), 381
TURNER, F. J., and L. E. WEISS. Deformational Kinks in Brucite and Gypsum, 359
TWENTE, J. A. *See* Twente, J. W., 1058
TWENTE, J. W., and TWENTE, J. A. Regulation of Hibernating Periods by Temperature, 1058

UHR, J. W. Passive Sensitization of Lymphocytes and Macrophages by Antigen-Antibody Complexes, 1599
Ultraviolet irradiation in photoreactivation of TMV-RNA (Merriam and Gordon), 1261
Uracil mustard, induction of cell death by (Booth *et al.*), 1803
URRY, D. W. Protein-Heme Interactions in Heme-Proteins: Cytochrome *c*, 640
Uterus, human, and progesterone (Csapo and Pinto-Dantas), 1069

Vaccinia: inhibition of, by isatin-β-thiosemicarbazone (Woodson and Joklik), 946; replication of (Dales), 462
VAGELOS, P. R. *See* Larrabee, A. R., 267
VARNER, J. E. *See* Aleem, M. I. H., 869
VASSALLI, P. *See* Mach, B., 975
Velocity of sound at high pressures (Anderson), 667
VESELL, E. S. Formation of Human Lactate Dehydrogenase Isozyme Patterns *in vitro*, 111
VILLEMEZ, C. L., T.-Y. LIN, and W. Z. HASSID. Biosynthesis of the Polygalacturonic Acid Chain of Pectin by a Particulate Enzyme Preparation from *Phaseolus aureus* Seedlings, 1626
VINOGRADOV, S. N. *See* Harbury, H. A., 1658
Viral inhibition of cellular RNA synthesis (Huang and Wagner), 1579
Viral RNA, replication of (Weissmann), 202; (Borst and Weissmann), 982
Virus, adenovirus-SV40 hybrids: in transformation of animal cells (Black and Todaro), 374, (Diamandopoulos and Enders), 1092; (Rowe), 711; (Rapp *et al.*), 717
Virus-induced synthesis of DNA (Gershon *et al.*), 1584
Virus multiplication inhibited by IBT (Woodson and Joklik), 946
Virus, Newcastle disease, nucleic acid of (Duesberg and Robinson), 794
Virus, polyoma, transforming ability of (Benjamin), 121; (Basilico and di Mayorca), 125
Virus production, effect of triethylene melamine on (Northrop), 1632
Virus-specific noncapsid proteins in HeLa cells (Summers *et al.*), 505
Virus, SV40, oncogenesis in hamsters (Girardi), 445
Viscoelastic behavior of paramyosin solutions (Allis and Ferry), 369
Vitamin A, β-carotene cleavage into (Olson and Hayaishi), 1364
Vitamin B_{12} compound, cobalt-free (Toohey), 934

WADA, K. *See* Segal, S. J., 782

WAELSCH, H., S.-C. CHENG, L. J. CÔTÉ, and H. NARUSE. CO_2 Fixation in the Nervous System, 1249
WAGNER, R. P. *See* Cronenwett, C. S., 1643
WAGNER, R. R., and A. S. HUANG. Reversible Inhibition of Interferon Synthesis by Puromycin: Evidence for an Interferon-Specific Messenger RNA, 1112
———. *See* Huang, A. S., 1579
WALSH, J. L. *See* Ahlberg, J. H., 344
WANG, L. *See* Aub, J. C., 400
WANG, T.-Y. Role of the Residual Nucleoprotein Complex and Acidic Proteins of the Cell Nucleus in Protein Synthesis, 800
WATANABE, A. *See* Tasaki, I., 763
Water in bacterial chemosynthesis (Aleem *et al.*), 869
WATTS, C. E. Alexander-Spanier Cohomology and Rings of Continuous Functions, 1027
WEBSTER, R. E. *See* Engelhardt, D. L., 1791
Wedderburn theorem (Rieffel), 1513
WEGMAN, J. *See* DeMoss, J. A., 241
Weierstrass analytic functions (Menger), 1025
WEILER, E., E. W. MELLETZ, and E. BREUNINGER-PECK. Facilitations of Immune Hemolysis by an Interaction between Red Cell-Sensitizing Antibody and γ-Globulin Allotype Antibody, 1310
———. Differential Activity of Allelic γ-Globulin Genes in Antibody-Producing Cells, 1765
WEINER, I. M., T. HIGUCHI, L. ROTHFIELD, M. SALTMARSH-ANDREW, M. J. OSBORN, and B. L. HORECKER. Biosynthesis of Bacterial Lipopolysaccharide, V. Lipid-Linked Intermediates in the Biosynthesis of the O-Antigen Groups of *Salmonella typhimurium*, 228
WEISS, L., and E. F. INFANTE. On the Stability of Systems Defined over a Finite Time Interval, 44
WEISS, L. E. *See* Turner, F. J., 359
WEISS, P., and A. PILLAI. Convection and Fate of Mitochondria in Nerve Fibers: Axonal Flow as Vehicle, 48
———. *See* Taylor, A. C., 1521
WEISSBACH, H. *See* Salzman, L. A., 542
WEISSMANN, C. Replication of Viral RNA, VII. Further Studies on the Enzymatic Replication of MS2 RNA, 202
———. *See* Borst, P., 982
WELCH, A. D. Inhibition by 2′-Deoxyadenosine of Enzyme Induction in *Pseudomonas testosteroni*, 1359
Wheat germ agglutinin, effects on malignant and normal cells (Aub *et al.*), 396, 400
White dwarf stars (Anand), 23
WHITE, J. R., and H. H. DEARMAN. Generation of Free Radicals from Phenazine Methosulfate, Streptonigrin, and Rubiflavin in Bacterial Suspensions, 887
WHYBURN, G. T. Directed Families of Sets and Closedness of Functions, 688
———. Continuity of Multifunctions, 1494
WILDER, R. L. A Problem of Bing, 683
WILHELM, R. C. *See* Engelhardt, D. L., 1791
WILLIAMS, C. A. *See* Ganoza, M. C., 294
WILLIAMS, C. M. *See* Sláma, K., 411
WILLIAMSON, D. L. *See* Ehrman, L., 481
WILSON, S. H., and M. B. HOAGLAND. Studies on the Physiology of Rat Liver Polyribosomes: Quantitation and Intracellular Distribution of Ribosomes, 600
WINOCOUR, E. *See* Gershon, D., 1584
WISE, E. M., JR., and J. T. PARK. Penicillin: Its Basic Site of Action as an Inhibitor of a Peptide Cross-Linking Reaction in Cell Wall Mucopeptide Synthesis, 75
WITTLER, R. G. *See* McGee, Z. A., 457
WITTNER, M. K. *See* Fox, E. N., 1118
WOESE, C. R. Order in the Genetic Code, 71
———. On the Evolution of the Genetic Code, 1546
WOOD, H. N., and A. C. BRAUN. Studies on the Net Uptake of Solutes by Normal and Crown-Gall Tumor Cells, 1532
WOOD, R. F. *See* Kamrin, M., 1285
WOOD, W. A. *See* Mortlock, R. P., 572
WOODS, P. S., and G. ZUBAY. Biochemical and Autoradiographic Studies of Different RNA's: Evidence That Transfer RNA Is Chromosomal in Origin, 1705
WOODSON, B., and W. K. JOKLIK. The Inhibition of Vaccinia Virus Multiplication by Isatin-β-Thiosemicarbazone, 946
WOOSTER, W. S. *See* Stommel, H., 8
WRIGHT, A., M. DANKERT, and P. W. ROBBINS. Evidence for an Intermediate Stage in the Biosynthesis of the *Salmonella* 0-Antigen, 235

X-ray diffraction of satellite TNV (Fridborg *et al.*), 513
X-ray inactivation: of polyoma virus (Benjamin), 121; of coliphage T7 (Freifelder), 128; of RF-DNA (Ginoza and Miller), 551
Xylene, meta- and para- (Jhon *et al.*), 1419

YAMASHIRO, D., H. L. AANNING, and V. DU VIGNEAUD. Inactivation of Oxytocin by Acetone, 166
YAN, Y. *See* Takanami, M., 1450
Yeast (Brock), 1104
YIELDING, K. L. *See* Cohen, S. N., 521
YODA, A. *See* Hokin, L. E., 177

Z-band in nemaline myopathy (Price *et al.*), 1398
Zeatin occurrence in maize (Miller), 1052
ZEHAVI-WILLNER, T. *See* Danon, D., 873
ZIFF, M. *See* Norton, W. L., 851
ZIMM, B. H. *See* Massie, H. R., 1636
———. *See* Massie, H. R., 1641
ZINDER, N. D. *See* Engelhardt, D. L., 1791
ZUBAY, G. *See* Sonnenberg, B. P., 415
———. *See* Woods, P. S., 1705

CONTENTS

NATIONAL ACADEMY OF SCIENCES

Page

Organization—Officers, Council, Members, Foreign Associates, and Sections . . 295

MATHEMATICS

A Generalization of Convexity, and Martingales in Linear Spaces . . . . . *By E. J. McShane* 37

On Cross Sections to Fiber Spaces . . . . . *By Emery Thomas* 40

Existence of Complete Minimal Surfaces of Arbitrary Connectivity and Genus . . . . . *By Tilla Klotz and Leo Sario* 42

On the Stability of Systems Defined over a Finite Time Interval . . . . . *By Leonard Weiss and E. F. Infante* 44

Mapping Theorems for Noncompact Nonlinear Operators in Banach Spaces . . . . . *By Felix E. Browder* 337

Stokes' Theorem on Real Analytic Varieties . . . . . *By Lutz Bungart* 343

Convergence Properties of Generalized Splines . . . . . *By J. H. Ahlberg, E. N. Nilson, and J. L. Walsh* 344

Integral Representation of Linear Continuous Operators from the Space of Lebesgue-Bochner Summable Functions into any Banach Space . . . . . *By Witold M. Bogdanowicz* 351

A Remark on the Central Limit Theorem . . . . . *By Lucien LeCam* 354

Locally Optimal Test for Homogeneity with Respect to Very Rare Events . . . . . *By W. Bühler, H. Fein, D. Goldsmith, J. Neyman, and P. S. Puri* 673

The Power Group of Two Permutation Groups . *By Frank Harary and Ed Palmer* 680

A Problem of Bing . . . . . *By R. L. Wilder* 683

Directed Families of Sets and Closedness of Functions . . *By G. T. Whyburn* 688

A Characterization of Weierstrass Analytic Functions . . . *By Karl Menger* 1025

Alexander-Spanier Cohomology and Rings of Continuous Functions . . . . . *By Charles E. Watts* 1027

The Higher-Dimensional Plateau Problem on a Riemannian Manifold . . . . . *By Charles B. Morrey, Jr.* 1029

An Example in Noetherian Rings . . . . . *By Lance W. Small* 1035

A Counterexample in Noetherian Rings . . . . . *By I. N. Herstein* 1036

Rigidity of Positively Curved Kaehler Manifolds . . . . . *By R. L. Bishop and S. I. Goldberg* 1037

Nonexpansive Nonlinear Operators in a Banach Space . . *By Felix E. Browder* 1041

On a New Approach to the Numerical Solution of a Class of Partial Differential Integral Equations of Transport Theory . . . . . *By Richard Bellman and Robert Kalaba* 1293

Continuity of Multifunctions . . . . . *By G. T. Whyburn* 1494

A New Approach to the Numerical Solution of a Class of Linear and Nonlinear Integral Equations of Fredholm Type . . . . . *By Richard Bellman* 1501

Algebraic Structure of Linear Dynamical Systems, I. The Module of Σ . . . . . *By R. E. Kalman* 1503

On the Group of Conformal Transformations of Compact Riemannian Manifold . . . . . *By Chuan-Chih Hsiung* 1509

A General Wedderburn Theorem . . . . . *By M. A. Rieffel* 1513

The Reduction of a Function near a Nondegenerate Critical Point . . . . . *By Marston Morse* 1759

Planar Graphs and Related Topics . . . . . *By Solomon Lefschetz* 1763

ASTRONOMY

Structured Cosmological Models . . . . . *By Guy C. Omer, Jr., Sumner G. Starrfield, and L. C. Kannenberg* 657

Red Shift Discretization in the Epochal Cosmology . . . . *By T. Y. Thomas* 994

Some New Methods for Planetary Exploration . . . . *By W. H. Pickering* 1471

PHYSICS

Statistical Mechanics and Irreversibility . . . . . *By Frank C. Andrews* 13
Quantum Corrections to the Equation of State for a Steep Repulsive Potential . . . . . *By Douglas Henderson and Sydney G. Davison* 21
On Chandrasekhar's Limiting Mass for Rotating White Dwarf Stars . . . . . *By S. P. S. Anand* 23
Shadow Scattering at Large Angles . . . . . *By R. Serber* 692
The Close-Packed-Spheron Model of Atomic Nuclei and Its Relation to the Shell Model . . . . . *By Linus Pauling* 989
Free Radicals Formed by Hydrogen Atom Bombardment of the Nucleic-Acid Bases . . . . . *By Janko N. Herak and Walter Gordy* 1287
Quantum Corrections to the Equation of State of Gases at High Temperatures and Densities . . *By Ru-yong Chen, Douglas Henderson, and Sydney G. Davison* 1514

CHEMISTRY

The Amino Acid Composition of Bone and Tooth Proteins in Late Pleistocene Mammals . . . . . *By Tong-yun Ho* 26
A Procedure for Molecular Weight Measurements: Application to Chymotrypsinogen A . . . . . *By Frank E. LaBar* 31
Dynamic Viscoelastic Behavior of Dilute Paramyosin Solutions . . . . . *By John W. Allis and John D. Ferry* 369
Chemical Enhancement of Superconductivity . . . . . *By H. M. McConnell, B. M. Hoffman, D. D. Thomas, and F. R. Gamble* 371
Quantum Chemical Studies of Charge-Transfer Complexes of Indoles . . . . . *By Jack Peter Green and J. P. Malrieu* 659
The Formation of Condensed Phosphate in Aqueous Solution . . . . . *By A. Beck and L. E. Orgel* 664
Effect of Methyl Groups upon the Solvent Power of Aliphatic Liquids . . . . . *By Joel H. Hildebrand and John Dymond* 1001
The Significant Structure Theory Applied to Liquid Hydrogen Halides . . . . . *By Joe Grosh, Mu Shik Jhon, Taikyue Ree, and Henry Eyring* 1004
Spin-Labeled Biomolecules . . . . . *By T. J. Stone, T. Buckman, P. L. Nordio, and H. M. McConnell* 1010
Studies of the Chymotrypsinogen Family, III. The Optical Rotatory Dispersion of α-Chymotrypsin . . . *By R. Biltonen, R. Lumry, V. Madison, and H. Parker* 1018
Electron Spin Resonance of Free Radicals in Perhydrotriphenylene Inclusion Compounds . . . . . *By O. Hayes Griffith* 1296
Occurrence of Biogenic Steranes and Pentacyclic Triterpanes in an Eocene Shale (52 Million Years) and in an Early Precambrian Shale (2.7 Billion Years): A Preliminary Report . . . . . *By A. L. Burlingame, Pat Haug, Theodore Belsky, and Melvin Calvin* 1406
Studies of the Chymotrypsinogen Family, IV. The Conversion of Chymotrypsinogen A to α-Chymotrypsin . . . . . *By R. Biltonen, R. Lumry, V. Madison, and H. Parker* 1412
The Significant Structure Theory Applied to Meta- and Para-Xylene . . . . . *By Mu Shik Jhon, Joe Grosh, Taikyue Ree, and Henry Eyring* 1419
The Relation between Prompt and Delayed Emission in Photosynthesis . . . . . *By Alexander Müller and Rufus Lumry* 1479
The Reaction of Hydrogen Atoms with Thymine and DNA . . . . . *By H. C. Heller and T. Cole* 1486
A Spin-Labeled Hapten . . . . . *By Lubert Stryer and O. Hayes Griffith* 1785

GEOLOGY

Electron Microscopy of the Gunflint Microflora: Preliminary Results . . . . . *By Preston E. Cloud, Jr., and Hannelore Hagen* 1

BOTANY

PROTOPLASTS FROM THE *Avena* COLEOPTILE . . . *By A. W. Ruesink and K. V. Thimann* 56
FIXATION IMAGES OF SIEVE ELEMENT PLASTIDS IN *Beta* . . . . . *By Katherine Esau* 429
CARBON ASSIMILATION OF MARINE PHYTOPLANKTON IN ANTARCTICA . . . . . *By Paul R. Burkholder and Enrique F. Mandelli* 437
ISOPIESTIC TECHNIQUE FOR MEASURING LEAF WATER POTENTIALS WITH A THERMOCOUPLE PSYCHROMETER . . . . . *By John S. Boyer and Edward B. Knipling* 1044
EVIDENCE FOR THE NATURAL OCCURRENCE OF ZEATIN AND DERIVATIVES: COMPOUNDS FROM MAIZE WHICH PROMOTE CELL DIVISION . . . . . *By Carlos O. Miller* 1052
SURVIVING CYTOPLASTS *in vitro* . . . . . *By A. Gibor* 1527
STUDIES ON THE NET UPTAKE OF SOLUTES BY NORMAL AND CROWN-GALL TUMOR CELLS . . . . . *By Henry N. Wood and Armin C. Braun* 1532

GENETICS

SEQUENCE OF ENZYME SYNTHESIS AND GENE REPLICATION DURING THE CELL CYCLE OF *Bacillus subtilis* . . . . . *By Millicent Masters and Arthur B. Pardee* 64
ORDER IN THE GENETIC CODE . . . . . *By C. R. Woese* 71
FORMATION OF HUMAN LACTATE DEHYDROGENASE ISOZYME PATTERNS *in vitro* . . . . . *By Elliot S. Vesell* 111
MUTAGEN-INDUCED HYBRIDIZATION OF *Salmonella typhimurium* LT2 × *Escherichia coli* K12 HFR . . . . . *By A. Eisenstark* 117
EVOLVING PATTERNS OF RNA METABOLISM DURING TRANSITION FROM RESTING STATE TO ACTIVE GROWTH IN LYMPHOCYTES STIMULATED BY PHYTOHEMAGGLUTININ . . . . . *By Arnold D. Rubin and Herbert L. Cooper* 469
ANALYSIS OF HISTONE *in situ* IN DEVELOPMENTALLY INACTIVATED CHROMATIN . . . . . *By Laurence Berlowitz* 476
TRANSMISSION BY INJECTION OF HYBRID STERILITY TO NONHYBRID MALES IN *Drosophila paulistorum:* PRELIMINARY REPORT . . *By Lee Ehrman and David L. Williamson* 481
LOCATION OF GENETIC LOCI OF RIBOSOMAL RNA ON *Bacillus subtilis* CHROMOSOME . . . . . *By Michio Oishi and Noboru Sueoka* 483
GENE CONSERVATION IN *Bacillus* SPECIES, I. CONSERVED GENETIC AND NUCLEIC ACID BASE SEQUENCE HOMOLOGIES . . . . . *By David Dubnau, Issar Smith, Pierre Morell, and Julius Marmur* 491
GENE CONSERVATION IN *Bacillus* SPECIES, II. THE LOCATION OF GENES CONCERNED WITH THE SYNTHESIS OF RIBOSOMAL COMPONENTS AND SOLUBLE RNA . . . . . *By David Dubnau, Issar Smith, and Julius Marmur* 724
A STOCHASTIC MODEL CONCERNING THE MAINTENANCE OF GENETIC VARIABILITY IN QUANTITATIVE CHARACTERS . . . . . *By Motoo Kimura* 731
FERTILIZATION IN *Drosophila*, II. TIME OF INACTIVATION OF A GENE EFFECT . . . . . *By Philip E. Hildreth* 736
A STUDY OF THE RELATIONSHIP BETWEEN THE CONTENT OF ADENOSINE TRIPHOSPHATE IN HUMAN RED CELLS AND THE COURSE OF FALCIPARUM MALARIA: A NEW SYSTEM THAT MAY CONFER PROTECTION AGAINST MALARIA . . . . . *By George J. Brewer and Robin D. Powell* 741
ROLE OF RIBOSOMES IN STREPTOMYCIN-ACTIVATED SUPPRESSION . . . . . *By W. French Anderson, Luigi Gorini, and Lee Breckenridge* 1076
A REGULATOR GENE THAT IS DOMINANT ON AN EPISOME AND RECESSIVE ON A CHROMOSOME . . . . . *By Alvin Markovitz and Nancy Rosenbaum* 1084
CHANGES IN CHROMOSOMES INDUCED BY MICROORGANISM INFECTION . . . . . *By M. Diaz and C. Pavan* 1321
LOW FREQUENCY OF CO-INTEGRATION OF TWO LINKED STREPTOMYCIN-RESISTANCE MARKERS IN PNEUMOCOCCUS . . . *By Minna B. Rotheim and Arnold W. Ravin* 1327
CHROMOSOME STRUCTURE IN PHAGE T4, II. TERMINAL REDUNDANCY AND HETEROZYGOSIS . . . . . *By Janine Séchaud, George Streisinger, Joyce Emrich, Judy Newton, Henry Lanford, Helen Reinhold, and Mary Morgan Stahl* 1333

Additional Evidence for Two Kinds of Heterozygotes in Phage T4 . . . . . *By Channa Shalitin and Franklin W. Stahl* 1340

The Genetic Structure of Complementation Heterozygotes . . . . . *By Franklin W. Stahl, Hella Modersohn, Betty E. Terzaghi, and Jean M. Crasemann* 1342

The Nature and Stability of Equilibria under Optimizing Selection . . . . . *By S. K. Jain and R. W. Allard* 1436

Segregation of the Conserved Units of DNA in *Escherichia coli* . . . . . *By Karl G. Lark and Robert E. Bird* 1444

Hybrid Compounds in Natural Interspecific Hybrids . . . . . *By R. E. Alston, H. Rösler, K. Naifeh, and T. J. Mabry* 1458

The Regulation of Synthesis of Leucine Biosynthetic Enzymes in *Neurospora* . . . . . *By S. R. Gross* 1538

On the Evolution of the Genetic Code . . . . . *By C. R. Woese* 1546

Effect of the Interval between Irradiation and Conception on Mutation Frequency in Female Mice . . . . . *By W. L. Russell* 1552

Transduction of *Escherichia coli* Genetic Material by Phage P22 in *Salmonella typhimurium* × *E. coli* Hybrids . . . . . *By A. Eisenstark* 1557

Linkage and Recombination between Nonchromosomal Mutations in *Chlamydomonas reinhardi* . . . . . *By Nicholas W. Gillham* 1560

Evidence for the Selective Origin of Incompatibility Barriers in the Leafy-Stemmed Gilias . . . . . *By Verne Grant* 1567

ZOOLOGY AND ANATOMY

Convection and Fate of Mitochondria in Nerve Fibers: Axonal Flow as Vehicle . . . . . *By Paul Weiss and Aiyappan Pillai* 48

Capacity for Photoperiodic Response and Endogenous Factors in the Reproductive Cycles of an Equatorial Sparrow . . . . . *By Alden H. Miller* 97

Transplantation of the Nuclei of Primordial Germ Cells into Enucleated Eggs of *Rana pipiens* . . . . . *By L. Dennis Smith* 101

Experimentally Induced Activation of the Ribosomes of the Unfertilized Sea Urchin Egg . . . *By Alberto Monroy, Rachele Maggio, and Anna M. Rinaldi* 107

Juvenile Hormone Activity for the Bug *Pyrrhocoris apterus* . . . . . *By Karel Sláma and Carroll M. Williams* 411

Nucleohistone as a Primer for RNA Synthesis . . . . . *By Beth P. Sonnenberg and G. Zubay* 415

A Bidiurnal Cycle in the Feeding Habit of *Perodicticus potto* . . . . . *By Ursula M. Cowgill* 420

Further Analysis of Sensory Coding in Electroreceptors of Electric Fish . . . . . *By Theodore H. Bullock and Shiko Chichibu* 422

Evidence for Prelocalization of Cytoplasmic Factors Affecting Gene Activation in Early Embryogenesis . . . . . *By Eric H. Davidson, G. W. Haslett, R. J. Finney, V. G. Allfrey, and A. E. Mirsky* 696

Cyclic Birefringence Changes in Pseudopods of *Chaos carolinensis* Revealing the Localization of the Motive Force in Pseudopod Extension . . . . . *By Robert D. Allen, David W. Francis, and Hiromichi Nakajima* 1153

Demonstration of Axonal Flow by the Movement of Tritium-Labeled Protein in Mature Optic Nerve Fibers . . . . . *By A. Cecil Taylor and Paul Weiss* 1521

PHYSIOLOGY

Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, III . . . . . *By R. Lorente de Nó and V. Honrubia* 82

Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, IV . . . . . *By R. Lorente de Nó and V. Honrubia* 388

Studies on Reactivity of Tumor and Normal Cells to a Wheat Germ Agglutinin . . . . . *By Joseph C. Aub, Barbara H. Sanford, and Marilyn N. Cote* 396

REACTIONS OF NORMAL AND LEUKEMIC CELL SURFACES TO A WHEAT GERM AGGLUTININ . . . . . *By Joseph C. Aub, Barbara H. Sanford, and Li-hsia Wang* 400
EXCITATION OF INTERNALLY PERFUSED SQUID GIANT AXONS IN SODIUM-FREE MEDIA . . . . . *By Ichiji Tasaki, Irwin Singer, and Akira Watanabe* 763
THEORY OF THE FLOW OF ACTION CURRENTS IN ISOLATED MYELINATED NERVE FIBERS, V . . . . . *By R. Lorente de Nó and V. Honrubia* 770
A COMPARISON OF THE ENZYMES AND SUBSTRATES OF GAMMA-AMINOBUTYRIC ACID METABOLISM IN LOBSTER EXCITATORY AND INHIBITORY AXONS . . . . . *By Edward A. Kravitz, Perry B. Molinoff, and Zach W. Hall* 778
ROLE OF RNA IN THE REGULATORY ACTION OF ESTROGEN . . . . . *By S. J. Segal, O. W. Davidson, and K. Wada* 782
REGULATION OF HIBERNATING PERIODS BY TEMPERATURE . . . . . *By John W. Twente and Janet A. Twente* 1058
THEORY OF THE FLOW OF ACTION CURRENTS IN ISOLATED MYELINATED NERVE FIBERS, VI . . . . . *By R. Lorente de Nó and V. Honrubia* 1061
THE EFFECT OF PROGESTERONE ON THE HUMAN UTERUS . . . . . *By A. I. Csapo and C. A. Pinto-Dantas* 1069
THEORY OF THE FLOW OF ACTION CURRENTS IN ISOLATED MYELINATED NERVE FIBERS, VII . . . . . *By R. Lorente de Nó and V. Honrubia* 1303
SEMIFORMAL REPRESENTATION OF ORGANISMIC CONCEPTS . . . *By Walter M. Elsasser* 1431
THEORY OF THE FLOW OF ACTION CURRENTS IN ISOLATED MYELINATED NERVE FIBERS, VIII . . . . . *By R. Lorente de Nó and V. Honrubia* 1606
EFFECTS OF UNIVALENT CATIONS ON THE IMMUNOELECTROPHORETIC BEHAVIOR OF PYRUVIC KINASE . . . . . *By George J. Sorger, Richard E. Ford, and Harold J. Evans* 1614

PATHOLOGY

In vitro TRANSFORMATION OF HAMSTER AND HUMAN CELLS WITH THE ADENO 7-SV40 HYBRID VIRUS . . . . . *By Paul H. Black and George J. Todaro* 374
TUMORS INDUCED IN HAMSTERS BY A STRAIN OF ADENOVIRUS TYPE 3: SHARING OF TUMOR ANTIGENS AND "NEOANTIGENS" WITH THOSE PRODUCED BY ADENOVIRUS TYPE 7 TUMORS . . . . *By R. J. Huebner, M. J. Casey, R. M. Chanock, and K. Schell* 381
INHIBITION OF DNA SYNTHESIS IN EHRLICH ASCITES CELLS BY ACTINOMYCIN D, I. DELAYED INHIBITION BY LOW DOSES . . . . . *By Renato Baserga, Richard D. Estensen, Robert O. Petersen, and John P. Layde* 745
THE ROLE OF INTERFERON IN THE INHIBITION OF SV40 TRANSFORMATION OF MOUSE CELL LINE 3T3 . . . . . *By George J. Todaro and Samuel Baron* 752
THE NUCLEIC ACID OF A MURINE LEUKEMIA VIRUS . . . . . *By Peter T. Mora and Vivian W. McFarland* 756
INHIBITION OF DNA SYNTHESIS IN EHRLICH ASCITES CELLS BY ACTINOMYCIN D, II. THE PRESYNTHETIC BLOCK IN THE CELL CYCLE . . . . . *By Renato Baserga, Richard D. Estensen, and Robert O. Petersen* 1141
THE REGULATION OF NUMBERS OF PRIMITIVE HEMOPOIETIC CELLS . . . . . *By Clifford W. Gurney and Walter Fried* 1148
FACILITATION OF IMMUNE HEMOLYSIS BY AN INTERACTION BETWEEN RED CELL-SENSITIZING ANTIBODY AND γ-GLOBULIN ALLOTYPE ANTIBODY . . . . . *By Eberhardt Weiler, Elsa W. Melletz, and Evelyn Breuninger-Peck* 1310
THE NATURE OF THE CELL MEMBRANE RECEPTOR FOR THE AGGLUTINATION FACTOR PRESENT IN THE SERA OF TUMOR PATIENTS AND PREGNANT WOMEN . *By Chloë Tal* 1318
NEW EVIDENCE FOR EXCESSIVE ACCUMULATION OF Z-BAND MATERIAL IN NEMALINE MYOPATHY . . . . . *By Harold M. Price, Gerald B. Gordon, Carl M. Pearson, Theodore L. Munsat, and Joe M. Blumberg* 1398
PASSIVE SENSITIZATION OF LYMPHOCYTES AND MACROPHAGES BY ANTIGEN-ANTIBODY COMPLEXES . . . . . *By Jonathan W. Uhr* 1599
DIFFERENTIAL ACTIVITY OF ALLELIC γ-GLOBULIN GENES IN ANTIBODY-PRODUCING CELLS . . . . . *By Eberhardt Weiler* 1765

TRENDS IN REPORTED INCIDENCE OF CANCER BY AGE IN CONNECTICUT AND IN NEW YORK STATE (1935–1960) . . . . . *By C. C. Little* 1779
CELL TURNOVER IN MAMMALIAN TISSUES: USE OF CELL DEPLETION MEASUREMENTS TO CALCULATE X-RAY REPRODUCTIVE SURVIVAL CURVES *in vivo* . *By Theodore T. Puck* 1797

MICROBIOLOGY

PENICILLIN: ITS BASIC SITE OF ACTION AS AN INHIBITOR OF A PEPTIDE CROSS-LINKING REACTION IN CELL WALL MUCOPEPTIDE SYNTHESIS . . . . . *By Edmund M. Wise, Jr., and James T. Park* 75
RELATIVE TARGET SIZES FOR THE INACTIVATION OF THE TRANSFORMING AND REPRODUCTIVE ABILITIES OF POLYOMA VIRUS . . . . . *By Thomas L. Benjamin* 121
RADIATION TARGET SIZE OF THE LYTIC AND THE TRANSFORMING ABILITY OF POLYOMA VIRUS . . . . . *By C. Basilico and G. di Mayorca* 125
MECHANISM OF INACTIVATION OF COLIPHAGE T7 BY X RAYS . . . *By David Freifelder* 128
PREVENTION OF SV40 VIRUS ONCOGENESIS IN HAMSTERS, I. TUMOR RESISTANCE INDUCED BY HUMAN CELLS TRANSFORMED BY SV40 . . . . . *By Anthony J. Girardi* 445
COLD-SENSITIVE MUTANTS OF *Escherichia coli* RESULTING FROM INCREASED FEEDBACK INHIBITION . . . . . *By Gerard A. O'Donovan and John L. Ingraham* 451
THE RELATIONSHIP OF *Mycoplasma pneumoniae* (EATON AGENT) TO *Streptococcus* MG: APPLICATION OF GENETIC TESTS TO DETERMINE RELATEDNESS OF L-FORMS AND PPLO TO BACTERIA . . *By Z. A. McGee, M. Rogul, S. Falkow, and R. G. Wittler* 457
EFFECTS OF STREPTOVITACIN A ON THE INITIAL EVENTS IN THE REPLICATION OF VACCINIA AND REOVIRUS . . . . . *By Samuel Dales* 462
CATABOLIC REPRESSION OF BACTERIAL SPORULATION . . . . . *By Pierre Schaeffer, Jacqueline Millet, and Jean-Paul Aubert* 704
STUDIES OF ADENOVIRUS-SV40 HYBRID VIRUSES, III. TRANSFER OF SV40 GENE BETWEEN ADENOVIRUS TYPES . . . . . *By Wallace P. Rowe* 711
SV40-ADENOVIRUS "HYBRID" POPULATIONS: TRANSFER OF SV40 DETERMINANTS FROM ONE TYPE OF ADENOVIRUS TO ANOTHER . . . . . *By Fred Rapp, Janet S. Butel, and Joseph L. Melnick* 717
STUDIES ON TRANSFORMATION OF SYRIAN HAMSTER CELLS BY SIMIAN VIRUS 40 (SV40): ACQUISITION OF ONCOGENICITY BY VIRUS-EXPOSED CELLS APPARENTLY UNASSOCIATED WITH THE VIRAL GENOME . . *By George Th. Diamandopoulos and John F. Enders* 1092
POSSIBLE INCORPORATION OF SV40 GENOME WITHIN CAPSID PROTEINS OF ADENOVIRUS 4 . . . . . *By John M. Easton and C. W. Hiatt* 1100
THE PURIFICATION AND CHARACTERIZATION OF AN INTRACELLULAR SEX-SPECIFIC MANNAN PROTEIN FROM YEAST . . . . . *By Thomas D. Brock* 1104
REVERSIBLE INHIBITION OF INTERFERON SYNTHESIS BY PUROMYCIN: EVIDENCE FOR AN INTERFERON-SPECIFIC MESSENGER RNA . *By Robert R. Wagner and Alice S. Huang* 1112
THE MULTIPLE MOLECULAR STRUCTURE OF THE M PROTEINS OF GROUP A STREPTOCOCCI . . . . . *By Eugene N. Fox and M. K. Wittner* 1118
INCREASE OF MALIGNANT POTENTIAL OF BHK-21 CELLS BY SV40 DNA WITHOUT PERSISTENT NEW ANTIGEN . . . . . *By Paul H. Black and Wallace P. Rowe* 1126
MECHANISM OF ACTION OF PENICILLINS: A PROPOSAL BASED ON THEIR STRUCTURAL SIMILARITY TO ACYL-D-ALANYL-D-ALANINE . . . . . *By Donald J. Tipper and Jack L. Strominger* 1133
EFFECT OF SIMPLE SUGARS ON THE MORPHOLOGY AND GROWTH PATTERN OF MAMMALIAN CELL CULTURES . . . . . *By Rody P. Cox and Bertram M. Gesner* 1571
INHIBITION OF CELLULAR RNA SYNTHESIS BY NONREPLICATING VESICULAR STOMATITIS VIRUS . . . . . *By Alice S. Huang and Robert R. Wagner* 1579
ON THE MECHANISM OF POLYOMA VIRUS-INDUCED SYNTHESIS OF CELLULAR DNA . . . . . *By David Gershon, Peter Hausen, Leo Sachs, and Ernest Winocour* 1584
THE SURFACE STRUCTURE OF *Escherichia coli* . . . . . *By Manfred E. Bayer and Thomas F. Anderson* 1592

PSYCHOLOGY

TOTAL SOCIAL ISOLATION IN MONKEYS . . . . . *By Harry F. Harlow, Robert O. Dodsworth, and Margaret K. Harlow* 90
A TECHNIQUE FOR ASSESSING VARIABILITY OF PERCEPTUAL SPAN . . *By W. K. Estes* 403
CROSS-MODALITY MATCHING OF BRIGHTNESS AND LOUDNESS . . . . . *By Joseph C. Stevens and Lawrence E. Marks* 407
CROSS-SPECIES TRANSFER OF LEARNING: EFFECT OF RIBONUCLEIC ACID FROM HAMSTERS ON RAT BEHAVIOR . . *By Frank R. Babich, Allan L. Jacobson, and Suzanne Bubash* 1299
EFFECTS OF CASTRATION AND ANDROGEN REPLACEMENT ON MATING IN MALE QUAIL . . . . . *By Frank A. Beach and Nelson G. Inman* 1426

GEOPHYSICS

RECONNAISSANCE OF THE SOMALI CURRENT DURING THE SOUTHWEST MONSOON . . . . . *By Henry Stommel and Warren S. Wooster* 8
DEFORMATIONAL KINKS IN BRUCITE AND GYPSUM . . . . . *By Francis J. Turner and Lionel E. Weiss* 359
OSCILLATIONS OF THE EARTH: NEW CORE-MANTLE BOUNDARY MODEL BASED ON LOW-ORDER FREE VIBRATIONS . . *By James Dorman, Jerome Ewing, and L. E. Alsop* 364
TWO METHODS FOR ESTIMATING COMPRESSION AND SOUND VELOCITY AT VERY HIGH PRESSURES . . . . . *By Orson L. Anderson* 667
ABIOGENIC SYNTHESIS IN THE MARTIAN ENVIRONMENT . . . *By Philip H. Abelson* 1490

BIOCHEMISTRY

CONTROL OF HEMOGLOBIN SYNTHESIS IN THE CULTURED CHICK BLASTODERM BY δ-AMINOLEVULINIC ACID SYNTHETASE: INCREASE IN THE RATE OF HEMOGLOBIN FORMATION WITH δ-AMINOLEVULINIC ACID . . . . . *By Richard D. Levere and S. Granick* 134
THE NUCLEIC ACID OF THE BRYAN STRAIN OF ROUS SARCOMA VIRUS: PURIFICATION OF THE VIRUS AND ISOLATION OF THE NUCLEIC ACID . . . . . *By William S. Robinson, Anna Pitkanen, and H. Rubin* 137
THE EFFECT OF STREPTOMYCIN ON ANTIBODY SYNTHESIS *in vitro* . *By Robert G. Krueger* 144
PURIFICATION AND PROPERTIES OF HISTIDINE DECARBOXYLASE FROM *Lactobacillus* 30A . . . . *By J. Rosenthaler, Beverly M. Guirard, G. W. Chang, and Esmond E. Snell* 152
PHOSPHORYLATION OF NUCLEIC ACID BY AN ENZYME FROM T4 BACTERIOPHAGE-INFECTED *Escherichia coli* . . . . . *By Charles C. Richardson* 158
INACTIVATION OF OXYTOCIN BY ACETONE . . . . . *By Donald Yamashiro, H. L. Aanning, and Vincent du Vigneaud* 166
SPECTRAL STUDIES OF THE INTERACTION OF α-CHYMOTRYPSIN AND TRYPSIN WITH PROFLAVINE . . . . . *By A. N. Glazer* 171
EVIDENCE THAT A PHOSPHORYLATED INTERMEDIATE IN A BRAIN TRANSPORT ADENOSINE TRIPHOSPHATASE IS AN ACYL PHOSPHATE . . . . . *By Lowell E. Hokin, P. S. Sastry, Peter R. Galsworthy, and Atsunobu Yoda* 177
RECOGNITION OF RIBOSOMAL RNA SITES IN DNA, II. THE HELA CELL SYSTEM . . . . . *By Giuseppe Attardi, Pien-Chien Huang, and Susan Kabat* 185
RUBREDOXIN: A NEW ELECTRON TRANSFER PROTEIN FROM *Clostridium pasteurianum* . . . . . *By Walter Lovenberg and Burton E. Sobel* 193
STUDIES ON AUTOBIOTICS: CHEMICAL NATURE OF RETINE . . . *By Laszlo G. Egyúd* 200
REPLICATION OF VIRAL RNA, VII. FURTHER STUDIES ON THE ENZYMATIC REPLICATION OF MS2 RNA . . . . . *By Charles Weissmann* 202
DNA ASSOCIATED WITH TOBACCO CHLOROPLASTS . . . . . *By W. S. Shipp, F. J. Kieras, and R. Haselkorn* 207
SPECIFIC BINDING OF sRNA TO RIBOSOMES: EFFECT OF STREPTOMYCIN . . . . . *By Hideko Kaji and Akira Kaji* 213
MEMBRANE SUBUNITS OF *Mycoplasma laidlawii* AND THEIR ASSEMBLY TO MEMBRANELIKE STRUCTURES . . *By Shmuel Razin, Harold J. Morowitz, and Thomas M. Terry* 219

NUCLEAR MAGNETIC RESONANCE EVIDENCE FOR COMPLEXING OF SODIUM IONS IN MUSCLE . . . . . *By Freeman W. Cope* 225

BIOSYNTHESIS OF BACTERIAL LIPOPOLYSACCHARIDE, V. LIPID-LINKED INTERMEDIATES IN THE BIOSYNTHESIS OF THE O-ANTIGEN GROUPS OF *Salmonella typhimurium* . . . . . *By I. M. Weiner, T. Higuchi, L. Rothfield, M. Saltmarsh-Andrew, M. J. Osborn, and B. L. Horecker* 228

EVIDENCE FOR AN INTERMEDIATE STAGE IN THE BIOSYNTHESIS OF THE *Salmonella* O-ANTIGEN . . . . . *By A. Wright, M. Dankert, and P. W. Robbins* 235

AN ENZYME AGGREGATE IN THE TRYPTOPHAN PATHWAY OF *Neurospora crassa* . . . . . *By J. A. DeMoss and Judith Wegman* 241

BIOSYNTHESIS OF GLYCOPROTEINS OF THE EHRLICH ASCITES CARCINOMA CELL MEMBRANES . . . . . *By G. M. W. Cook, M. Theresa Laico, and Edwin H. Eylar* 247

PROTEIN SUBSTRATE CONFORMATION AND PROTEOLYSIS . . . . *By Gabor Markus* 253

A RELATIONSHIP BETWEEN THE HALLUCINOGENIC ACTIVITY OF DRUGS AND THEIR ELECTRONIC CONFIGURATION . . . . *By Solomon H. Snyder and Carl R. Merril* 258

ACYL CARRIER PROTEIN, V. IDENTIFICATION OF 4′-PHOSPHOPANTHEINE BOUND TO A MAMMALIAN FATTY ACID SYNTHETASE PREPARATION . . . . . *By Allan R. Larrabee, Ernest G. McDaniel, Howard A. Bakerman, and P. Roy Vagelos* 267

EARLY INTRACELLULAR EVENTS IN THE REPLICATION OF T4 PHAGE DNA, I. COMPLEX FORMATION OF REPLICATIVE DNA . . . *By Andrzej W. Kozinski and T. H. Lin* 273

SEQUENTIAL REPRESSION AND DEREPRESSION OF THE ENZYMES FOR HISTIDINE BIOSYNTHESIS IN *Salmonella typhimurium* . . . . . *By Robert F. Goldberger and Mary Anne Berberich* 279

REQUIREMENT OF RIBONUCLEOTIDE REDUCTASE FOR COBAMIDE COENZYME, A PRODUCT OF RIBOSOMAL ACTIVITY . . . . . *By William S. Beck and Jennifer Hardy* 286

TURNOVER OF TEMPLATE-BOUND HISTONE . *By G. Roger Chalkley and H. Rainer Maurer* 498

EVIDENCE FOR VIRUS-SPECIFIC NONCAPSID PROTEINS IN POLIOVIRUS-INFECTED HELA CELLS . . *By Donald F. Summers, Jacob V. Maizel, Jr., and James E. Darnell, Jr.* 505

PURIFICATION, ELECTRON MICROSCOPY, AND X-RAY DIFFRACTION STUDIES OF THE SATELLITE TOBACCO NECROSIS VIRUS . . . . . *By K. Fridborg, S. Hjertén, S. Höglund, A. Liljas, B. K. S. Lundberg, P. Oxelfelt, L. Philipson, and B. Strandberg* 513

INHIBITION OF DNA AND RNA POLYMERASE REACTIONS BY CHLOROQUINE . . . . . *By Stanley N. Cohen and K. Lemone Yielding* 521

INTRACELLULAR MITOCHONDRIAL DIVERSITY IN VARIOUS STRAINS OF *Saccharomyces cerevisiae* . . . . *By Charlotte J. Avers, Martha W. Rancourt, and Fu Hai Lin* 527

SUBUNIT EXCHANGE AND LIGAND BINDING: A NEW HYPOTHESIS FOR THE MECHANISM OF OXYGENATION OF HEMOGLOBIN . . . . . *By Ruth E. Benesch, Reinhold Benesch, and George Macduff* 535

CONVERSION OF C^{14}- AND CIS- OR TRANS-4-H^3-L-PROLINE TO 4-HYDROXY-L-PROLINE AND 4-OXO-L-PROLINE BY *Streptomyces antibioticus* . . . . . *By Lois A. Salzman, Herbert Weissbach, and Edward Katz* 542

BIOCHEMICAL STUDIES ON ADENOVIRUS MULTIPLICATION, IX. CHEMICAL AND BASE COMPOSITION ANALYSIS OF 28 HUMAN ADENOVIRUSES . . . . . *By Magdalena Piña and Maurice Green* 547

KINETICS OF X-RAY AND HEAT INACTIVATION OF ϕX174 RF-DNA . . . . . *By W. Ginoza and R. C. Miller* 551

C-REACTIVE PROTEIN: A MOLECULE COMPOSED OF SUBUNITS . . . . . *By E. C. Gotschlich and G. M. Edelman* 558

DIFFERENTIAL INTERACTION OF NOGALAMYCIN WITH DNA OF VARYING BASE COMPOSITION . . . . . *By B. K. Bhuyan and C. G. Smith* 566

A BASIS FOR UTILIZATION OF UNNATURAL PENTOSES AND PENTITOLS BY *Aerobacter aerogenes* . . . . . *By R. P. Mortlock, D. D. Fossitt, and W. A. Wood* 572

SPECIFIC TEMPLATE REQUIREMENTS OF RNA REPLICASES . . . . . *By I. Haruna and S. Spiegelman* 579

INCORPORATION OF GLYCINE INTO THE CELL WALL GLYCOPEPTIDE IN *Staphylococcus aureus*: ROLE OF sRNA AND LIPID INTERMEDIATES . . . . . *By Michio Matsuhashi, Carl P. Dietrich, and Jack L. Strominger* 587

SEPARATION OF DEOXYRIBO-OLIGONUCLEOTIDASES INDUCED BY INFECTION WITH BACTERIOPHAGE T2 . . . . . *By Everett C. Short, Jr., and James F. Koerner* 595

STUDIES ON THE PHYSIOLOGY OF RAT LIVER POLYRIBOSOMES: QUANTITATION AND INTRACELLULAR DISTRIBUTION OF RIBOSOMES . . . . . *By Samuel H. Wilson and Mahlon B. Hoagland* 600

ALKYLATION OF POLYRIBONUCLEOTIDES: THE BIOLOGICAL, PHYSICAL, AND CHEMICAL PROPERTIES OF ALKYLATED POLYURIDYLIC ACID . . . . . *By C. W. Abell, L. A. Rosini, and M. R. Ramseur* 608

THE BIOSYNTHESIS OF MICROSOMAL-BOUND COLLAGEN PRECURSORS IN RABBIT EMBRYO SKIN *in vitro* . . . . . *By Isaac J. Bekhor, Ziaeddin Mohseni, Marcel E. Nimni, and Lucien A. Bavetta* 615

A DEOXYRIBONUCLEASE FOUND AFTER INFECTION OF *Bacillus subtilis* WITH PHAGE SP3 . . . . . *By David M. Trilling and H. Vasken Aposhian* 622

HORMONE-DEPENDENT DIFFERENTIATION OF MAMMARY GLAND *in vitro* . . . . . *By William G. Juergens, Frank E. Stockdale, Yale J. Topper, and Joel J. Elias* 629

EARLY INTRACELLULAR EVENTS IN THE REPLICATION OF T4 PHAGE DNA, II. PARTIALLY REPLICATED DNA . . . . . *By Andrzej W. Kozinski and P. B. Kozinski* 634

PROTEIN-HEME INTERACTIONS IN HEME-PROTEINS: CYTOCHROME *C*. *By Dan W. Urry* 640

STRUCTURE OF A POLYSACCHARIDE PROTEIN COMPLEX . . . . . *By Eric Marler and E. A. Davidson* 648

MEMORY FIXATION IN THE GOLDFISH . . . . . *By Bernard W. Agranoff, Roger E. Davis, and John J. Brink* 788

ISOLATION OF THE NUCLEIC ACID OF NEWCASTLE DISEASE VIRUS (NDV) . . . . . *By Peter H. Duesberg and William S. Robinson* 794

ROLE OF THE RESIDUAL NUCLEOPROTEIN COMPLEX AND ACIDIC PROTEINS OF THE CELL NUCLEUS IN PROTEIN SYNTHESIS . . . . . *By Tung-Yue Wang* 800

COENZYME INTERACTIONS: PROTON MAGNETIC RESONANCE STUDY OF MOLECULAR COMPLEXES OF THIAMINE AND INDOLE DERIVATIVES . . . . . *By Henry Z. Sable and John E. Biaglow* 808

THE ROLE OF DNA IN RNA SYNTHESIS, IX. NUCLEOSIDE TRIPHOSPHATE TERMINI IN RNA POLYMERASE PRODUCTS . . . . *By Umadas Maitra and Jerard Hurwitz* 815

REDUCTIVE DISSOCIATION OF CHICKEN γG IMMUNOGLOBULIN IN NEUTRAL SOLVENTS WITHOUT A DISPERSING AGENT . . *By Gordon R. Dreesman and Albert A. Benedict* 822

ENZYMATIC SYNTHESIS OF DEOXYRIBONUCLEOTIDES, VIII. THE EFFECTS OF ATP AND dATP IN THE CDP REDUCTASE SYSTEM FROM *E. coli* . . . . . *By Arne Holmgren, Peter Reichard, and Lars Thelander* 830

ENZYMATIC OXIDATION OF STEROIDS BY CELL-FREE EXTRACTS OF *Pseudomonas testosteroni*: ISOLATION OF CLEAVAGE PRODUCTS OF RING A . . . . . *By Dennis A. Shaw, Louise F. Borkenhagen, and Paul Talalay* 837

TEMPLATE STABILITY OF SOME ENZYMES IN RAT LIVER AND HEPATOMA . . . . . *By Henry C Pitot, Carl Peraino, Carlos Lamar, Jr., and Alfred L. Kennan* 845

THE EFFECT OF PROGRESSIVE IMMUNIZATION ON POLYRIBOSOMAL SIZE IN LYMPHOID CELLS . . . . . *By W. L. Norton, David Lewis, and Morris Ziff* 851

GROWTH CHARACTERISTICS OF REOVIRUS TYPE 2: ACTINOMYCIN D AND THE SYNTHESIS OF VIRAL RNA . . . . . *By Philip C. Loh and M. Soergel* 857

THE MOLECULAR BASIS OF ANTIBODY FORMATION: A PARADOX . . . . . *By W. J. Dreyer and J. Claude Bennett* 864

WATER AS THE SOURCE OF OXIDANT AND REDUCTANT IN BACTERIAL CHEMOSYNTHESIS . . . . . *By M. I. H. Aleem, G. E. Hoch, and J. E. Varner* 869

ALTERATIONS IN POLYRIBOSOMES OF RETICULOCYTES MATURING *in vivo* . . . . . *By D. Danon, T. Zehavi-Willner, and G. R. Berman* 873

DENATURED DNA AS A DIRECT TEMPLATE FOR *in vitro* PROTEIN SYNTHESIS . . . . . *By B. J. McCarthy and J. J. Holland* 880

GENERATION OF FREE RADICALS FROM PHENAZINE METHOSULFATE, STREPTONIGRIN, AND RUBIFLAVIN IN BACTERIAL SUSPENSIONS . . . . . *By James R. White and Henry H. Dearman* 887

SPECIFIC LABELING AND PARTIAL PURIFICATION OF THE *M* PROTEIN, A COMPONENT OF THE β-GALACTOSIDE TRANSPORT SYSTEM OF *Escherichia coli* . . . . . *By C. Fred Fox and Eugene P. Kennedy* 891

CITRATE CLEAVAGE IN ADIPOSE TISSUE . . . *By Melodee S. Kornacker and Eric G. Ball* 899

GENETIC IMPLICATIONS OF PERIODIC PULSATIONS OF THE RATE OF SYNTHESIS AND THE COMPOSITION OF RAPIDLY LABELED BACTERIAL RNA . . . . . *By Rivka Rudner, Ewa Rejman, and Erwin Chargaff* 904

THE BIOSYNTHESIS OF CHONDROITIN-SULFATE PROTEIN COMPLEX . . . . . *By Alvin Telser, H. C. Robinson, and Albert Dorfman* 912

THE SYNTHESIS OF A SELF-PROPAGATING AND INFECTIOUS NUCLEIC ACID WITH A PURIFIED ENZYME . *By S. Spiegelman, I. Haruna, I. B. Holland, G. Beaudreau, and D. Mills* 919

QUENCHING OF CHLOROPLAST FLUORESCENCE BY PHOTOSYNTHETIC PHOSPHORYLATION AND ELECTRON TRANSFER . . . . . *By Daniel I. Arnon, Harry Y. Tsujimoto, and Berah D. McSwain* 927

A VITAMIN B_{12} COMPOUND CONTAINING NO COBALT . . . . . *By John I. Toohey* 934

CHANGE IN ANTIBODY CONFORMATION INDUCED BY HAPTEN . . . . . *By A. L. Grossberg, G. Markus, and D. Pressman* 942

THE INHIBITION OF VACCINIA VIRUS MULTIPLICATION BY ISATIN-β-THIOSEMICARBAZONE . . . . . *By Bruce Woodson and Wolfgang K. Joklik* 946

RNA CODEWORDS AND PROTEIN SYNTHESIS, VIII. NUCLEOTIDE SEQUENCES OF SYNONYM CODONS FOR ARGININE, VALINE, CYSTEINE, AND ALANINE . . . . . *By R. Brimacombe, J. Trupin, M. Nirenberg, P. Leder, M. Bernfield, and T. Jaouni* 954

HISTONE-BOUND RNA, A COMPONENT OF NATIVE NUCLEOHISTONE . . . . . *By Ru-chih C. Huang and James Bonner* 960

THE REPRESSION AND INDUCTION BY THYROXIN OF HEMOGLOBIN SYNTHESIS DURING AMPHIBIAN METAMORPHOSIS . . . . *By Bernard Moss and Vernon M. Ingram* 967

BIOSYNTHESIS OF RNA IN ANTIBODY-PRODUCING TISSUES . . . . . *By Bernard Mach and Pierre Vassalli* 975

REPLICATION OF VIRAL RNA, VIII. STUDIES ON THE ENZYMATIC MECHANISM OF REPLICATION OF MS2 RNA . . . . . *By Piet Borst and Charles Weissmann* 982

INACTIVATION OF PEPSIN BY DIPHENYLDIAZOMETHANE . . . . . *By Georges R. Delpierre and Joseph S. Fruton* 1161

THE POLARITY OF MESSENGER TRANSLATION IN PROTEIN SYNTHESIS . . . . . *By R. E. Thach, M. A. Cecere, T. A. Sundararajan, and Paul Doty* 1167

COMPARISON OF β-GALACTOSIDASES FROM NORMAL ($i^-o^+z^+$) AND OPERATOR CONSTITUTIVE ($i^-o^cz^+$) STRAINS OF *E. coli* . . . . . *By Edward Steers, Jr., Gary R. Craven, and Christian B. Anfinsen* 1174

FORMATION AND FATE OF ABNORMAL RIBOSOMES OF *E. coli* CELLS TREATED WITH 5-FLUOROURACIL . . . . . *By Toshiwo Andoh and Erwin Chargaff* 1181

RECOGNITION OF SIZE AND SEQUENCE BY AN RNA REPLICASE . . . . . *By I. Haruna and S. Spiegelman* 1189

THE *in vitro* TRANSLATION OF A MONOCISTRONIC MESSAGE . . . . . *By J. M. Clark, Jr., A. Y. Chang, S. Spiegelman, and M. E. Reichmann* 1193

SPECIFIC DEGRADATION OF THE COLLAGEN MOLECULE BY TADPOLE COLLAGENOLYTIC ENZYME . . . . . *By Jerome Gross and Yutaka Nagai* 1197

THE ROLE OF HISTONES IN THE MAINTENANCE OF CHROMATIN STRUCTURE . . . . . *By V. C. Littau, C. J. Burdick, V. G. Allfrey, and A. E. Mirsky* 1204

THE SYNTHESIS OF α-KETOGLUTARATE FROM SUCCINATE AND CARBON DIOXIDE BY A SUBCELLULAR PREPARATION OF A PHOTOSYNTHETIC BACTERIUM . . . . . *By Bob B. Buchanan and M. C. W. Evans* 1212

MULTIPLE FORMS OF HEXOKINASE IN THE RAT: TISSUE DISTRIBUTION, AGE DEPENDENCY, AND PROPERTIES . . . . . *By Howard M. Katzen and Robert T. Schimke* 1218

THE ROLE OF ACYLCARNITINE ESTERS AND CARNITINE PALMITYLTRANSFERASE IN THE TRANSPORT OF FATTY ACYL GROUPS ACROSS MITOCHONDRIAL MEMBRANES . . . . . *By Irving B. Fritz and Norman R. Marquis* 1226

LIPOAMINO ACIDS AS PRECURSORS IN THE SYNTHESIS OF AUTHENTIC PROTEINS BY HOMOGENATES OF HEN OVIDUCT . . . . . *By Richard W. Hendler* 1233

THE STRUCTURAL GENE FOR DEOXYRIBONUCLEIC ACID POLYMERASE IN BACTERIOPHAGES T4 AND T5 . . . . . *By A. de Waard, A. V. Paul, and I. R. Lehman* 1241

CO_2 FIXATION IN THE NERVOUS SYSTEM . . . . . *By H. Waelsch, S.-C. Cheng, L. J. Côté, and H. Naruse* 1249

A STRUCTURAL GENE MUTATION IN *Salmonella typhimurium* RESULTING IN REPRESSIBILITY OF ADENYLOSUCCINASE . . . . . *By Mary Anne Berberich and Joseph S. Gots* 1254

PHOTOREACTIVATION OF TOBACCO MOSAIC VIRUS RIBONUCLEIC ACID FOLLOWING NEAR ULTRAVIOLET IRRADIATION . . . *By Virginia Merriam and Milton P. Gordon* 1261

IMMUNOCHEMICAL STUDIES OF INTESTINAL DISACCHARIDASES DURING NORMAL AND PRECOCIOUS DEVELOPMENT . . . . . *By Ruth G. Doell, Gerald Rosen, and Norman Kretchmer* 1268

CHARACTERIZATION OF RIBONUCLEASE-RESISTANT RNA FROM POLIOVIRUS-INFECTED HELA CELLS . . *By J. Michael Bishop, Donald F. Summers, and Leon Levintow* 1273

PRODUCTION OF ANTIBODIES TO SOLUBLE RNA (sRNA) . . . . *By Otto J. Plescia, Nicholas C. Palczuk, Elisa Cora-Figueroa, Amal Mukherjee, and Werner Braun* 1281

ANILIDES AND PHENYLUREAS: RETRACTION OF AN EARLIER CALCULATION WHICH RELATED PI-ELECTRON STRUCTURE TO INHIBITION OF PHOTOSYNTHESIS . . . . . *By Michael Kamrin, Walter F. Bertsch, and R. F. Wood* 1285

THE ROLE OF RNA SYNTHESIS IN THE PRODUCTION OF GLUTAMINE SYNTHETASE BY DEVELOPING CHICK NEURAL RETINA . . . . . *By David L. Kirk* 1345

TRANSLATIONAL INHIBITION IN MITOTIC HELA CELLS . . . . . *By Jesse M. Salb and Philip I. Marcus* 1353

INHIBITION BY 2′-DEOXYADENOSINE OF ENZYME INDUCTION IN *Pseudomonas testosteroni* . . . . . *By Arnold D. Welch* 1359

THE ENZYMATIC CLEAVAGE OF β-CAROTENE INTO VITAMIN A BY SOLUBLE ENZYMES OF RAT LIVER AND INTESTINE . . . . *By James Allen Olson and Osamu Hayaishi* 1364

INCREASED TEMPLATE ACTIVITY OF LIVER CHROMATIN, A RESULT OF HYDROCORTISONE ADMINISTRATION . . . . . *By Michael E. Dahmus and James Bonner* 1370

INDUCED ORIENTATION OF THE GROWTH OF MALIGNANT CELLS *in vitro* . . . . . *By Ruth Johnsson and Andrew Hegyeli* 1375

STUDIES ON POLYNUCLEOTIDES, XLIX. STIMULATION OF THE BINDING OF AMINOACYL-sRNA'S TO RIBOSOMES BY RIBOTRINUCLEOTIDES AND A SURVEY OF CODON ASSIGNMENTS FOR 20 AMINO ACIDS . . . . . *By D. Söll, E. Ohtsuka, D. S. Jones, R. Lohrmann, H. Hayatsu, S. Nishimura, and H. G. Khorana* 1378

COMPARATIVE BIOCHEMISTRY OF DRUG METABOLISM BY AZO AND NITRO REDUCTASE . . *By Richard H. Adamson, Robert L. Dixon, Frances L. Francis, and David P. Rall* 1386

OPTICAL ROTATORY DISPERSION OF CYTOCHROME *c* . . . . . *By Yash P. Myer and Henry A. Harbury* 1391

THE RELEASE OF POLYPEPTIDE CHAINS FROM RIBOSOMES IN CELL-FREE AMINO ACID-INCORPORATING SYSTEMS BY SPECIFIC COMBINATIONS OF BASES IN SYNTHETIC POLYRIBONUCLEOTIDES . . . . . *By Mituru Takanami and Yonhon Yan* 1450

THE ROLE OF RIBOSOMAL RNA IN THE CONTROL OF RIBOSOMAL PROTEIN SYNTHESIS . . . . . *By R. E. Ecker* 1465

THE AMINO ACID SEQUENCE OF CYTOCHROME *c* OF *Neurospora crassa* . . . . . *By Joram Heller and Emil L. Smith* 1621

BIOSYNTHESIS OF THE POLYGALACTURONIC ACID CHAIN OF PECTIN BY A PARTICULATE ENZYME PREPARATION FROM *Phaseolus aureus* SEEDLINGS . . . . . *By C. L. Villemez, Tsau-Yen Lin, and W. Z. Hassid* 1626

PRODUCTION OF A NEW BACTERIAL VIRUS BY PROLONGED GROWTH OF LYSOGENIC *E. coli* CULTURES IN THE PRESENCE OF TRIETHYLENE MELAMINE . *By John H. Northrop* 1632

MOLECULAR WEIGHT OF THE DNA IN THE CHROMOSOMES OF *E. coli* AND *B. subtilis* . . . . . *By Harold R. Massie and Bruno H. Zimm* 1636

THE USE OF HOT PHENOL IN PREPARING DNA . . . . . *By Harold R. Massie and Bruno H. Zimm* 1641

Over-All Synthesis of Isoleucine by Membrane Fractions of *Salmonella typhimurium* . . . . . *By Carolyn S. Cronenwett and R. P. Wagner* 1643
The Isolation and Some Properties of Rat Liver Mitochondrial Deoxyribonucleic Acid . . . . . *By Walter C. Schneider and Edward L. Kuff* 1650
Complex Formation between Methionine and a Heme Peptide from Cytochrome *c* . . . . . *By Henry A. Harbury, John R. Cronin, Michael W. Fanger, Thomas P. Hettinger, Alexander J. Murphy, Yash P. Myer, and Serge N. Vinogradov* 1658
Cytochrome *f* and Plastocyanin: Their Sequence in the Photosynthetic Electron Transport Chain of *Chlamydomonas reinhardi* . . . . . *By Donald S. Gorman and R. P. Levine* 1665
Direction of Synthesis of Messenger RNA in Cells of *Escherichia coli* . . . . . *By Avram Goldstein, Joel B. Kirschbaum, and Ann Roman* 1669
Inhibition of *Escherichia coli* and Bacteriophage Lambda Messenger RNA Synthesis by T4 . . . . . *By William S. Hayward and Melvin H. Green* 1675
The Cell-Free Biosynthesis of the Glycoprotein of Membranes from Ehrlich Ascites Carcinoma Cells . . . . . *By Edwin H. Eylar and G. M. W. Cook* 1678
The Nucleic Acid from Avian Myeloblastosis Virus Compared with the RNA from the Bryan Strain of Rous Sarcoma Virus . . . . . *By William S. Robinson and Marcel A. Baluda* 1686
Repression of Enzyme Synthesis at the Translational Level and Its Hormonal Control . . . . . *By Francis T. Kenney and William L. Albritton* 1693
Studies on the Conformation of Human Serum High-Density Lipoproteins HDL_2 and HDL_3 . . . . . *By A. Scanu* 1699
Biochemical and Autoradiographic Studies of Different RNA's: Evidence That Transfer RNA Is Chromosomal in Origin . . . . . *By Philip S. Woods and Geoffrey Zubay* 1705
A Lipopolysaccharide Inhibitor of a DNA Methyl Transferase . . . . . *By Arturo Falaschi and Arthur Kornberg* 1713
Inactivity of Purified Reovirus RNA as a Template for *E. coli* Polymerases *in vitro* . . . . . *By Aaron J. Shatkin* 1721
Nonconservative DNA Replication in Bacteria after Thymine Starvation . . . . . *By Crellin Pauling and Philip Hanawalt* 1728
A DNA-RNA Complex as an Intermediate of *in vitro* Genetic Transcription . . . . . *By Masaki Hayashi* 1736
Structural Basis of Biological and Immunological Activity of Parathyroid Hormone. . . . . *By John T. Potts, Jr., G. D. Aurbach, Louis M. Sherwood, and A. Sandoval* 1743
A Polycistronic Messenger RNA Associated with β-Galactosidase Induction . . . . . *By Yukio Kiho and Alexander Rich* 1751
Tryptic Peptides from the Active Sites of Antibody Molecules . . . . . *By Russell F. Doolittle and S. J. Singer* 1773
In vitro Studies on the Mechanism of Suppression of a Nonsense Mutation . . . *By Dean L. Engelhardt, Robert E. Webster, Robert C. Wilhelm, and Norton D. Zinder* 1791

ERRATA

Synthesis of Serum Proteins by a Cell-Free System from Rat Liver . . . . . *By M. Clelia Ganoza, Curtis A. Williams, and Fritz Lipmann* 294
DNA Associated with Tobacco Chloroplasts . . . . . *By W. S. Shipp, F. J. Kieras, and R. Haselkorn* 1470
Alterations in Cellular Metabolism Associated with Cell Death Induced by Uracil Mustard and 6-Thioguanine . . . . . *By Barbara A. Booth, William A. Creasy, and Alan C. Sartorelli* 1803
Theory of the Flow of Action Currents in Isolated Myelinated Nerve Fibers, VI . . . . . *By R. Lorente de Nó and V. Honrubia* 1803
The Nature and Stability of Equilibria under Optimizing Selection . . . . . *By S. K. Jain and R. W. Allard* 1804